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MINNESOTA MEDICINE

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Minneapolis Surgical Society*

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THE DIAGNOSIS AND TREATMENT OF MAJOR INFECTIONS OF THE HAND*

SUMNER L. KOCH, M.D.
Chicago

IN discussing the subject of infections of the hand it is scarcely necessary for me to remind this association of our indebtedness to Dr. Allen B. Kanavel. Our accurate knowledge of the diagnostic symptoms and of the proper method of treatment of infections of the hand is based upon the original experimental and clinical studies which he began to report in 1905.

There are three types of infections of the hand of so great importance and of such frequent occurrence that every medical man should possess the ability to recognize them promptly and treat them correctly. They are acute lymphangitis, infections of the flexor tendon sheaths, and infections of the fascial spaces of the palm.

Acute Lymphangitis.—An acute spreading infection of the lymphatics usually follows a trivial injury—a penetrating wound from a sliver, a pin, a surgical needle or tonsil snare, a scratch from a nail, or from a sharp splinter of wood or metal. Within a few hours of the injury the affected finger is hot and painful, and there is a more or less diffuse inflammatory reaction about the site of injury. Soon red streaks appear which extend up the forearm (Fig. 1). The patient feels restless and ill; his temperature rises; he has chilly sensations, and within twenty-four hours he may be acutely ill with repeated chills, high fever and prostration.

On examining the hand one finds the greatest reaction about the site of injury, but there is no evidence of pus formation; the symptoms are not confined to the distal phalanx, as in the case of a paronychia or felon; movement of the affected finger does not cause noticeable pain and does not exaggerate the symptoms present. Palpation of the elbow and axilla usually reveals tender and enlarged lymph glands even within twenty-four hours of the onset.

With such a clinical picture—a history of injury, local signs of inflammation, red streaks of lymphatic extension along the forearm and arm, and the early development of systemic symptoms of acute infection—there can be no doubt as to the presence of a virulent and rapidly spreading infection, usually of streptococcic origin. Nor is there any question as to the wisest method of treatment. The patient should be put to bed, the entire upper extremity enveloped in a warm, wet, sterile dressing and fluids given in the largest quantity possible. Surgical intervention in such cases causes a rapid extension of the infectious process with disastrous results. Unless one can secure localization of the infectious process by conservative measures he may be sure that active surgical intervention will only hasten an inevitably fatal outcome.

A typical instance of such an infection came to my attention recently. A physician, forty-eight years of age, sustained a slight abrasion of his right index finger. He paid no particular attention to it, and a few days later, on a Saturday afternoon, operated upon a patient with a Bartholinian abscess. The same evening he noticed that the finger was inflamed and painful. He felt restless and irritable, and finally went to his office and picked at the finger with a scalpel. All Saturday night the finger and hand throbbed and ached; he was restless and slept very little. Early Sunday morning he called a colleague, who infiltrated the finger thoroughly with procaine, incised it, and stated he was certain there was no pus there, for he cut down to the bone.

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*From the department of surgery, Northwestern University Medical School. Read at the annual meeting of the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

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When I saw the patient Monday evening he was obviously very ill. Perspiration was standing in beads on his face and neck; his temperature was 103°; he had had several severe chills.

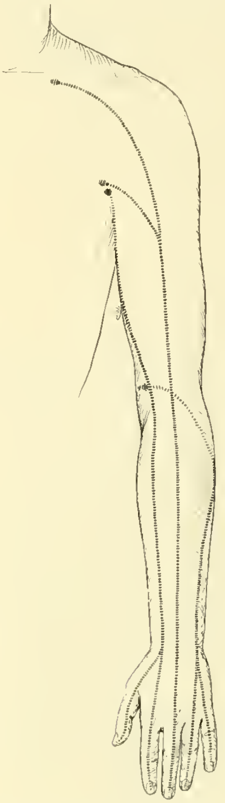

Fig. 1. Position of the main lymphatic trunks, and of the red lines of lymphatic extension in acute lymphangitis. (Kanavel and Mason, Sajous' Encyclopedia of Medicine.)

There was a thin serous discharge from an incision three-quarters of an inch in length on the palmar surface of the right index finger. Red streaks extended up the forearm and arm, converging toward the axilla. Fortunately no further surgery had been done and at the suggestion of a former student of Dr. Kanavel, who had seen the patient Monday morning, a massive, warm, wet dressing had been applied to the entire upper extremity throughout Monday. This treatment was continued; fluids were administered by mouth and by rectum, and the patient made a gradual and uneventful recovery without definite localization of the infection or abscess formation.

The outcome in the majority of cases is not so fortunate a one. Too often the patient's resistance is insufficient to overcome the virulent infection; surgical interference causes wider diffusion of the infection; septicemia and pyemia rapidly develop, and the patient dies.

Tendon Sheath Infections.—Tendon sheath infections usually result from direct inoculation or from extension of infection from the subcutaneous tissues. Their gravity lies in the fact that they spread with remarkable rapidity, and that destruction of the tendon sheath and of the tendon itself ensues in a very short time unless the infected area is drained, and prompt measures instituted to maintain the function of the tendons.

The tendon sheaths of the index, middle and ring fingers extend from a point just distal to the distal flexion crease of the finger to a line closely approximating the distal flexion crease of the palm (Fig. 2). They lie in close apposition to the palmar surface of the phalanges and are separated from the bone only by a thin layer of connective tissue. An infection of the flexor sheaths of any of these fingers makes itself evident very promptly by pain, swelling, inability to extend the fingers completely and by tenderness which corresponds definitely and accurately to the anatomical outlines of the tendon sheath.

The sheath of the long flexor of the thumb begins at a point slightly distal to the distal flexion crease of the thumb, and accompanies the flexor pollicis longus through the palm to terminate a thumb's breadth above the anterior annular ligament in an expansion known as the radial bursa (Fig. 2). Over the first metacarpal bone it lies between the flexor pollicis brevis and the adductor obliquus. The motor branch to the muscles of the thenar eminence lies superficial to the tendon sheath, approximately an inch above the annular ligament. The bursa ends in a blind pouch under the tendon and upon the pronator quadratus, separated by the latter from the wrist joint and the radio-ulnar joint.

The tendon sheath of the flexors of the little finger begins just distal to the distal flexion crease of the fifth finger and extends proximalward to become continuous, in the majority of cases, with the ulnar bursa, a good sized sac which lies over the metacarpal bone of the ring finger and the base of the middle metacarpal bone, and extends proximalward under the anterior annular ligament a thumb's breadth above the ligament (Fig. 2). Here it lies underneath the flexor tendons, upon the pronator quadratus muscle, and is separated by this muscle from the wrist joint. In the region of the wrist joint the ulnar bursa forms a more or less complete sheath for the flexor tendons, being pushed radialward, as it were, in three pockets—one superficial to the tendons, one between the superficial and deep tendons and one, the largest and most easily distensible, underneath the deep tendons.

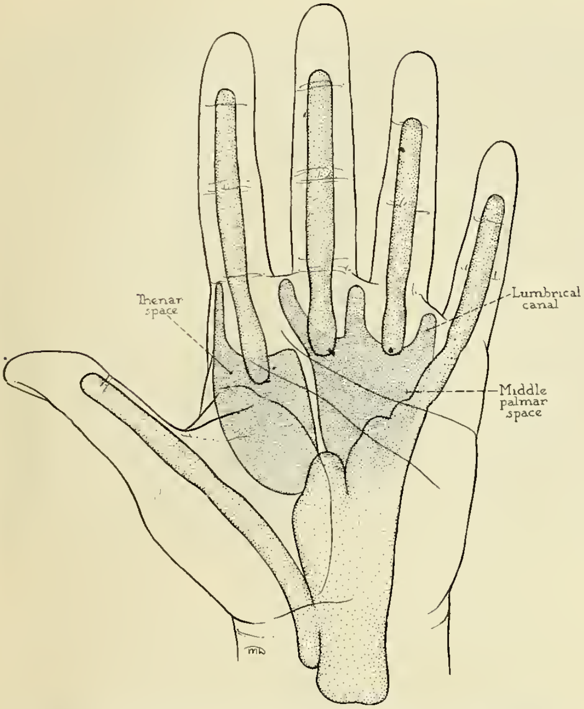

Fig. 2. Diagram showing the tendon sheaths and fascial spaces of the palm. (Kanavel and Mason, Sajous' Encyclopedia of Medicine.)

The exact arrangement of the tendon sheaths in the proximal portion of the palm and over the wrist is subject to considerable variation. The important fact from a practical standpoint is that in the majority of cases the radial and ulnar bursæ communicate with one another by way of an intermediary sheath, so that an infection of the tendon sheath of the thumb and radial bursa usually extends to the ulnar bursa and distally along the tendon sheath of the little finger. An infection arising in the tendon sheath of the fifth finger involves the same structures in the reverse order. From these various sites infection may extend to a number of different places, as will be indicated later.

The diagnosis of a tendon sheath infection is based on symptoms which early in the course of the infection are limited to the area involved, but which tend very quickly to become more difficult of interpretation because of extension of the infection to surrounding tissues. These symptoms are pain, tenderness and other signs of inflammation, frequently out of proportion to the extent of the infected area. The patient holds the affected finger in a slightly flexed position. Any attempt to extend it causes him to wince with pain. By gentle pressure an area of tenderness may be outlined which corresponds accurately to the anatomical outline of the tendon sheath. In every case the dorsum of the affected finger is swollen and edematous because of the direction of lymphatic drainage and the greater distensibility of the tissues of the dorsum of the hand as contrasted with those of the palmar surface.

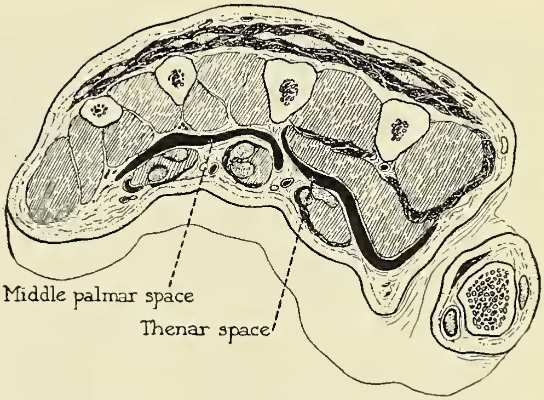

Fig. 3. Cross section of the palm above the metacarpophalangeal joints showing the position of the thenar and middle palmar spaces. (After Kanavel.)

If the infection involves only the index, middle or ring finger there is no doubt as to its location and the freedom of other fingers from infection. With infection of the radial and ulnar bursæ the inflamed swollen wrist, with the tense anterior annular ligament drawn like a taut cord across its volar surface, suggests at once the extension of the infection into the forearm. Since in more than eighty per cent of cases the radial bursa communicates with the ulnar bursa above the wrist it is common to find involvement of both bursæ. In early cases, however, it may be difficult to determine whether one is dealing with one of the less common types in which the bursæ do not communicate with one another. If, for example, the infection has begun in the thumb and spread into the radial bursa one wishes to be certain whether the ulnar bursa and the tendon sheath of the fifth finger are involved. In such a case the position in which the fifth finger is held, the presence of pain on attempted extension of the finger, and the presence of a point of maximum tenderness where the distal flexion crease of the palm crosses the flexor tendons of the fifth finger (Kanavel's sign) are important considerations. If one is still in doubt it is wise through a bloodless field to make an exploratory incision in the palm over the sheath of the flexor tendons of the fifth finger. If no infection is present no harm will be done by such a procedure, but irreparable injury may be done if the infected sheath is not drained. If the primary infection involves the tendon sheath of the fifth finger, the same considerations apply with reference to the radial bursa and the flexor tendon sheath of the thumb.

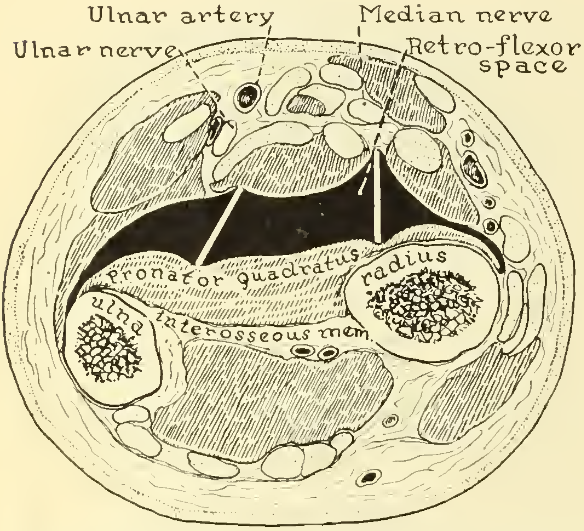

Fig. 4. The retroflexor space above the wrist into which pus ruptures from the radial and ulnar bursæ. (After Kanavel.)

In cases which have been neglected for four or five days, or which have been drained inadequately, the median and ulnar nerves may be so compressed by the pressure of the exudate above the wrist as to be partially anesthetized. In such cases the characteristic symptoms mentioned above—particularly the excruciating pain caused by attempted extension of the affected fingers—are masked, but the history, the location of the primary lesion, the bulging swelling above the wrist, and the general symptoms of severe infection make the diagnosis clear.

When rupture takes place from the tendon sheaths of the index, middle or ring fingers the pus spreads into one of the fascial spaces of the palm, and forms an abscess of the thenar space or the middle palmar space (Figs. 2, 3). (These will be discussed under infections of the fascial spaces.) When rupture takes place from the radial or ulnar bursa the pus at first lies in the retroflexor space between the flexor tendons and the pronator quadratus (Fig. 4). As it spreads upward it dissects between the superficial and deep flexor muscles and tends to become superficial along the ulnar side of the upper third of the forearm. In such an event the entire hand and forearm are dusky red, swollen, tense, and edematous. Vesicles or blebs may cover large areas of the affected extremity. Because of the extent of the involvement and the retention of a large amount of pus under pressure, toxic absorption proceeds at a rapid rate and the general symptoms of severe infection—high fever, rapid pulse, profuse perspiration, prostration, and not uncommonly delirium—indicate the extreme gravity of the condition.

Infection of the Fascial Spaces of the Palm.—These include the thenar space, the middle palmar space and the lumbrical canals which extend distalward from the thenar and middle palmar spaces along the lumbrical muscles. Infection of the fascial spaces of the palm may occur by direct inoculation and as the result of deep, penetrating wounds, but most commonly occurs as the result of extension of a tendon sheath infection.

The thenar space (Figs. 2, 3) lies upon the adductor muscles of the thumb partially covered by the short muscles of the thenar eminence, by the flexor tendons of the index finger and by the accompanying digital vessels and nerves (Figs. 2, 3). It extends ulnarward to the middle metacarpal bone. The middle palmar space lies deep in the palm upon the interosseous muscles, underneath the flexor tendons of the middle and ring fingers. On the radial side it extends to the middle metacarpal bone. On the ulnar side it is partially covered by the overlying distal end of the ulnar bursa.

Tendon sheath infections arising in the index finger tend to rupture into the thenar space. Tendon sheath infections arising in the middle and ring fingers usually rupture into the middle palmar space. In neglected cases tendon sheath infections starting in the thumb may rupture into the thenar space, and tendon sheath infections arising in the fifth finger into the middle palmar space. With pus under great tension rupture from one space into the other may take place.

The symptoms of thenar space infection are pain, tenderness and swelling of the thenar eminence. Normally the thenar eminence is the most prominent portion of the palm, but with infection in the thenar space it stands out in such a pronounced fashion as to elevate the thenar eminence still more above the remainder of the palm and force the thumb away from the hand (Fig. 5). The dorsum of the web between the thumb and index finger is swollen and edematous. Eventually there is extension of the infection along the lumbrical canal on the radial side of the index finger, with tenderness and swelling on the dorsum of the hand between the index and middle fingers.

With infection of the middle palmar space the striking symptoms are the loss of the normal concavity of the palm and the edema and swelling of the dorsum of the hand. Because the pus lies under the flexor tendons and the firm palmar fascia the palmar swelling is not pronounced, but it is sufficient to change the normal concavity of the palm into a slight convexity. Because of the direction of lymphatic drainage the dorsum of the hand is swollen and edematous, but pus will not be found on the dorsum except in those neglected cases in which the infection has extended distalward along the lumbrical canals and passed to the dorsum in the subcutaneous tissue about the web of the fingers. Only in grave, neglected infections in which osteomyelitis has taken place does pus find its way through the barrier of deep fascia, interosseous muscles, and metacarpal bones from the palm to the dorsum of the hand.

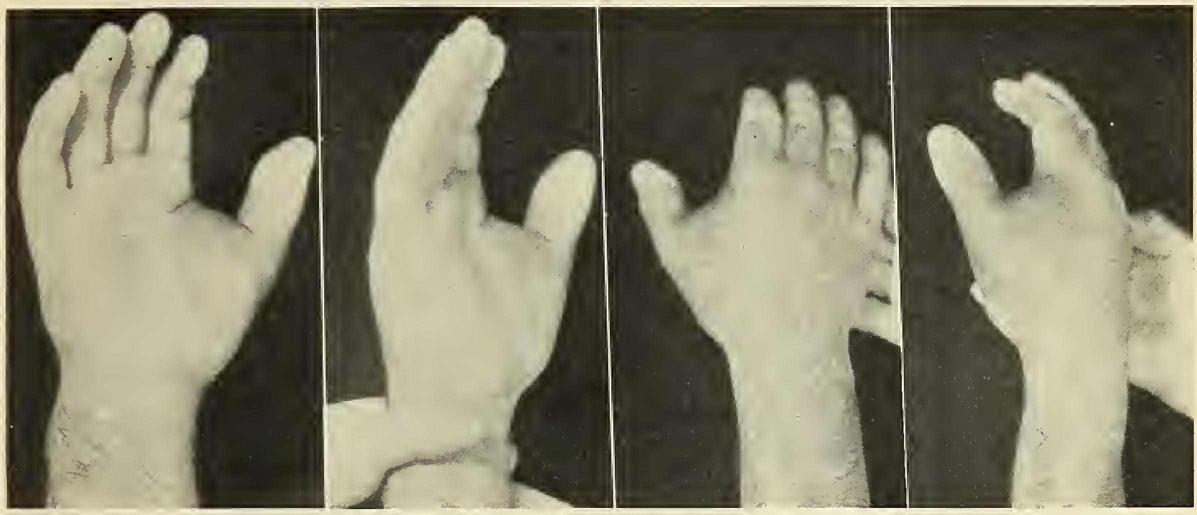

Fig. 5. Infection of thenar space, resulting in marked swelling of the thenar area and forced abduction of the thumb from the index finger.

Treatment of Tendon Sheath and Fascial Space Infections.—The treatment of infections of the tendon sheaths and fascial spaces is to secure adequate drainage as soon as the condition is recognized. This should be done under a general anesthetic such as nitrous oxide, ethylene or ether, and through a bloodless field secured with the aid of a constrictor.

In draining the tendon sheaths of the fingers the incision should be made well to the side of the finger (Fig. 6), so as to avoid the digital nerves and blood vessels, the flexion creases on the palmar surface, and so as to prevent herniation of the tendon from its sheath, a complication that occurs very promptly if the sheath is opened through the middle of the palmar surface of the finger.

On incising a finger with infection of the tendon sheath one is always surprised by the extensive swelling of the subcutaneous tissues, and by the manner in which they seem to fill the entire wound and obstruct the deeper structures from view. Unless this edematous tissue is well retracted it is impossible to secure a clear view of or even to expose the deeply lying tendon sheath. If one can expose the sheath for a little distance before incising it with the scalpel he will find instead of a thin translucent membrane through which the shining tendon may be discerned, a grayish edematous structure which resembles the edematous peritoneum overlying an appendiceal abscess. The moment it is opened the pus pours out. In very early cases the pus may not yet fill the sheath, and may appear only when the tendon is raised from the posterior surface of its sheath.

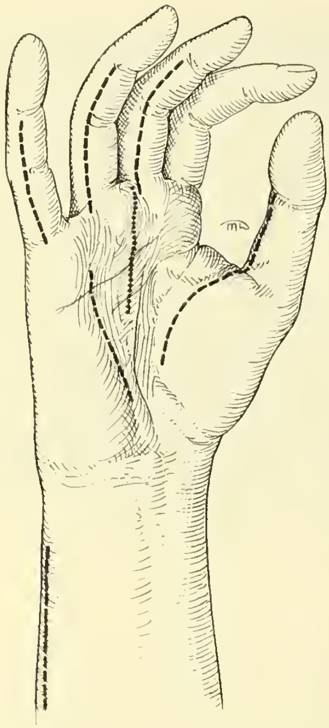

Fig. 6. Incisions for drainage of the middle palmar space and of the tendon sheaths of the fingers and thumb. (Kanavel and Mason, Sajous' Encyclopedia of Medicine.)

If the flexor sheaths of the thumb and little finger are involved the incisions must be extended upward (Fig. 6). One should avoid cutting through the muscles of the thenar eminence in the case of the thumb by making a curved incision to the ulnar side of the thenar eminence and retracting the thenar muscles radialward, and should remember that the flexor tendons of the little finger run obliquely upward and radialward and not in the line of the fifth metacarpal bone. Such an infection also requires an incision on the ulnar side of the forearm to drain the upper, most distensible portions of the ulnar and radial bursæ (Figs. 4, 6). It should always be made at the side, never over the middle of the volar surface, for the pus lies underneath the flexor tendons. A median incision in such a case inevitably leads to extensive fibrosis and destruction of tendons and frequently to operative or postoperative injury of the median nerve.

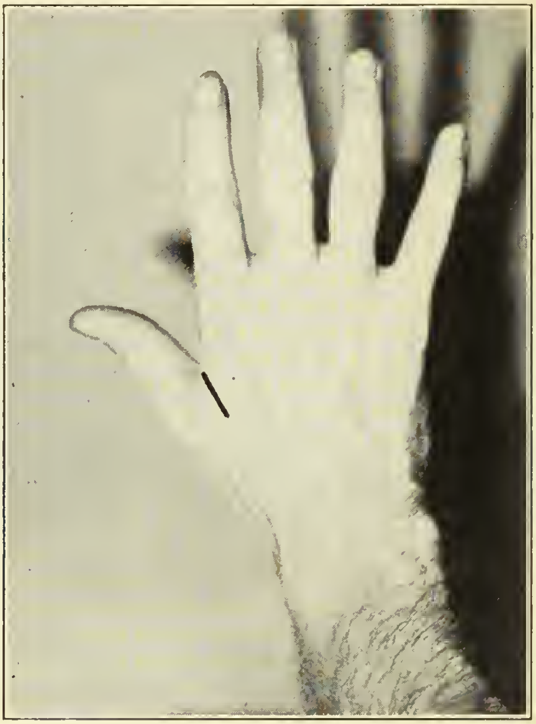

Fig. 7. Line of incision for drainage of thenar space.

The middle palmar space is drained through an incision between the middle and ring fingers, extending from just above the web of the fingers to the middle flexion crease of the palm. The flexor tendons, digital nerves, and blood vessels of the middle finger are retracted to the radial side and the corresponding structures of the ring finger to the ulnar side. The middle palmar space, as it lies behind the flexor tendons, is then widely exposed. Occasionally an additional incision over the lumbrical canal of the ring finger helps to make drainage more complete and hasten recovery. Through the incision indicated for drainage of the thenar space (Fig. 7) a pair of forceps or Kocher dissector is passed upward and ulnarward directly into the abscess cavity as it lies upon the adductor muscles of the thumb.

If drainage incisions are located correctly and of adequate length, an incision on one side of the affected fingers and on the ulnar side of the forearm, in the case of ulnar and radial bursæ infections, suffices for drainage. The use of through-and-through drainage above or underneath a flexor tendon should be carefully avoided. It is the surest possible method of causing necrosis of the tendons.

With infections of the middle palmar and thenar spaces, drains should never be inserted through and through from the palm to the dorsum of the hand. The spaces in question are separated from the dorsal surface by a number of anatomical layers (Fig. 3). Plunging a pair of forceps through the deep volar fascia, the interosseous muscles, between metacarpal bones and through the dorsal aponeurotic and subcutaneous layers in order to drain an accumulation of pus in one of the fascial spaces of the palm renders almost certain the development of osteomyelitis and the formation of persistent sinuses.

After Treatment of Tendon Sheath and Fascial Space Infections.—In order to stop venous oozing after operations and to keep wound edges widely separated, drainage wounds are packed lightly with gauze impregnated with petrolatum. Occasionally rubber tissue is used instead. Tubes are never used because pressure necrosis of tendons and tendon sheaths and extensive fibrosis involving tendon and nerves inevitably result from their use.

In dressing the hand a large sterile towel is laid on the arm board, covered with abdominal pads and sterile dressings, and the outstretched arm is laid on the bed of dressings. More dressings are added to cover the arm; the dressings are saturated with a warm, sterile boric or salt solution and the edges of the towel brought together to enclose the whole. The warm solution is added at two-hour intervals without changing the dressing and a powerful electric light is suspended above the arm to help maintain the heat.

At the end of twenty-four hours the dressings are removed and a sterile dressing reapplied with the same care that was used in applying the original dressing. If one can avoid adding secondary infection, particularly to streptococcic infections of the tendon sheaths, the tendons may be saved and a complete restoration of function secured in a considerable proportion of cases.

The petrolatum gauze is removed at the first or second post-operative dressing. No drainage material is reinserted after removal of the original drains.

As soon as the acute symptoms have subsided, usually at the end of three or four days, an arm bath, used for fifteen or twenty minutes twice daily, is substituted for the continuous moist dressing. After being soaked in a warm, sterile solution the arm is laid on a sterile towel, allowed to dry for a half hour under an electric light and covered with a dry dressing. While the hand is in the bath the patient is urged to move his fingers gently to prevent the formation of fibrous adhesions. Simply moving the fingers through their complete range of motion once or twice daily during the period of forced immobilization suffices to prevent the formation of crippling adhesions. In addition to the dry dressing a light aluminum splint is applied to maintain the hand and the fingers in the position of function. As soon as the danger of lighting up the infection has passed, physical therapy and active exercises are begun so that restoration of function may keep pace with the healing of the tissues.

Summary.—The major infections of the hand—acute lymphangitis, infections of the tendon sheaths and infections of the fascial spaces of the palm, present definite and unmistakable diagnostic criteria.

Lymphatic infections should be treated conservatively and operated upon only when there are unequivocal signs of pus formation. Infections of the tendon sheaths and fascial spaces of the palm should be drained carefully and adequately as soon as the diagnosis is made.

In the post-operative care of hand infections the prevention of secondary infection, early mobilization and the maintenance of the hand in the position of function during the period of enforced immobilization are important details of treatment.

INTRA-ABDOMINAL LOCAL ANESTHESIA*

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THE purpose of this paper is to review some of the advantages, disadvantages and important technical points in the administration of intra-abdominal splanchnic anesthesia, together with the neuro-anatomy of the viscera. I am indebted to Doctor Robert Emmett Farr, with whom I was formerly associated, and to Doctor Stanley R. Maxeiner, with whom I am associated at the present time, for much of my subject matter.

INDICATIONS

There is nothing controversial in choice of anesthesia for the rugged, healthy individual, but in the chronically ill, in the aged, in cases of sepsis and in toxic states such as that due to late bowel obstruction, we believe that local anesthesia is the preferable method. Certainly, there is no one ideal anesthetic. It is not the purpose of this article to compare the limitations of spinal or the hazards of general anesthesia; each one of these forms of anesthesia is applicable to the individual case. Local anesthesia enables the surgeon to carry out his work with due deliberation and makes it unnecessary to sacrifice careful technic for speed. During the past year and one-half, we have induced over 85 spinal anesthesias and in some of the difficult cases, requiring longer procedures, the spinal anesthesia had waned before the completion of the operation, and at this stage we complemented the anesthetic by the establishment of intra-abdominal sympathetic anesthesia and infiltration of the abdominal wall with novocaine solution in order to reach our objective. In other words, a knowledge of the technic of intra-abdominal local anesthesia is an adjunct to the armamentarium of the surgeon relying on spinal anesthesia or mixed anesthesia, as recommended by Crile,[1] which depends for its efficacy on the completeness of the local anesthesia. The results obtained from the use of intra-abdominal local anesthesia are contingent upon the skill of inducing the anesthesia and also the ability to apply the special surgical technic which is necessary in order to operate successfully with this type of anesthesia. At the present time many surgeons with practically no training in the method consider themselves able to perform intra-abdominal operations under local anesthesia. They believe all there is to the method is to puddle the skin and fascia with novocaine, having no regard for anatomic landmarks, surgical strategy or the indication for splanchnic anesthesia. The chief difficulty encountered with intra-abdominal local anesthesia is the elimination of traction pain when the intra-abdominal organs are manipulated. The traction pain of normal organs is not great but it is increased when inflammatory processes are at work. Generally speaking, operations upon organs coming naturally in contact with the abdominal wall or those which can be readily brought up to it may most readily be performed, such as stomach and hernia operations. It is the establishment of anesthesia upon organs which normally lie deeper and require traction upon mesenteric attachments which we will dwell upon mostly.

DISADVANTAGES

The method cannot be used successfully in cases of sepsis where the operative field is infected. Intra-abdominal sympathetic anesthesia cannot be carried out satisfactorily in the presence of very large tumors and where inflammatory matting of viscera or organs is present. The exact state of the intra-abdominal organs cannot always be anticipated until the abdomen is opened. In operations involving acutely inflamed regions which are deep in the abdominal cavity and where there is secondary attachment of the diseased part to the posterior peritoneum with abscess formation, the blocking off of the sympathetics is technically a major procedure. In other instances, after the exposed organ to be worked upon has been manipulated and especially if the patient is not coöperative, an evisceration of bowel can readily take place even though the surrounding viscera has previously been packed away. It is this type of accident which very often discourages the use of the method. Local anesthesia cannot be used in cases of psychic incompatibility.

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*Thesis read before the Minneapolis Surgical Society, May 21, 1931.

ANATOMICAL CONSIDERATIONS

Familiarity with the anatomy of the underlying structures and the general direction of the nerve supply of the abdominal wall is essential before one essays to adopt this method. Anatomically, operations on the abdomen are divided into two groups—those in which the operative objective involves only the abdominal wall, such as hernias, lipomas and tumors, and those in the second group, whose objective requires the opening of the abdominal cavity. It is this latter group which will be discussed.

SENSIBILITY OF THE ABDOMINAL WALL

The anterior abdominal wall including skin, fascia, muscles and parietal peritoneum receives its nerve supply from the 7th to the 12th intercostal and the ilioinguinal and iliohypogastric nerves. A few sensory fibers emanate from the parietal peritoneum through the round ligament of the liver and terminate in the region of the umbilicus. It must be remembered that this latter structure should be thoroughly infiltrated with the anesthetic solution, not only because of its sensory nerve supply but because of attachment to the posterior parietal peritoneum in the region of the liver, and traction of the abdominal wall in upper abdominal work causes indirect pulling of the sensitive posterior peritoneum. The thoracic nerves, after leaving the spinal canal, accompany the intercostal vessels and reach the anterior region of the abdomen by passing superficial to the transversalis muscle and give off branches which supply the skin, oblique and recti muscles. Other branches are given off which perforate the transversalis muscle and form a plexus superficial to the peritoneum. Thus, the abdominal wall receives branches from the lower six thoracic nerves and from the ilioinguinal and iliohypogastric nerves (Fig. 1).

THE SENSATION OF PAIN IN ABDOMINAL ORGANS DURING SURGICAL PROCEDURES

Lennander,[2] in 1901, was one of the pioneers to evolve a theory of abdominal sensations. His theories in their original forms are now considered obsolete; however, he deserves great credit for stimulating study of this problem.

Neumann,[3] in 1912, produced clear-cut experiments which are still tenable. These experiments were unknown to Kappis,[4] who independently came to similar conclusions at about the same time. Kappis' conception involves a consideration of the following facts:

"Sensory fibers leading from the lateral horns of the cord follow through rami communicantes directly to the retroperitoneal ganglia. From here the fibers follow the blood vessels to the intra-abdominal organs. In the organs, the fibers are so fine that they are practically missing and no sensibility is present. Certain regions have sufficient sensory fibers present and caliber adequate to transmit sensation of pain by proper stimulus. These regions are mesentery, lesser omentum, region of cystic, hepatic and common duct, splenic and renal vascular areas and larger vessels."

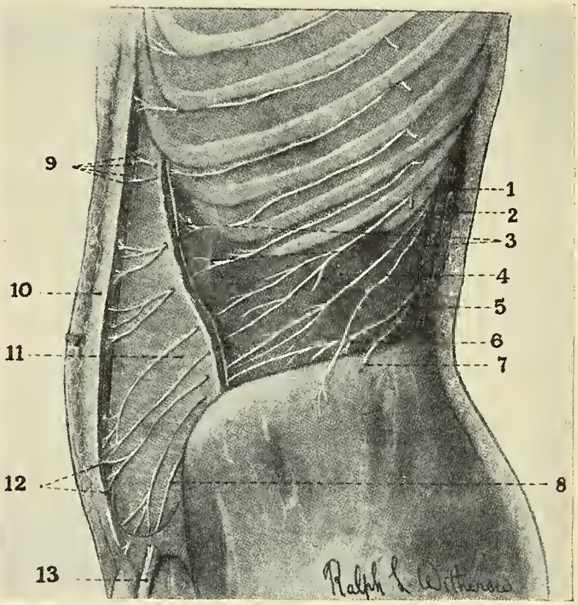

Fig. 1. Nerve supply of the abdominal wall. 1, costa XII; 2, N. intercostalis XII; 3, rami musculares; 4, M. transversus abdominis; 5, N. iliohypogastricus; 8, N. ilioinguinalis; 9, rami cutanei anteriores, N. intercostalis VIII; 10, sheath M. rectus abdominis; 11, M. obliquus internus abdominis; 12, rami cutanei anteriores, N. intercostalis XII; 13, funiculus spermaticus. (Photograph of illustration from Farr's "Practical Local Anesthesia.")

The accepted proof of this theory is the clinical result of splanchnic block or the physiological response to stimuli such as inflammatory processes as manifested by reflex muscle spasm over the segment involved. It is, at the present time, generally accepted that viscera such as liver, spleen, stomach and intestines are insensitive to pain by manipulations such as cutting or burning. Traction or clamping may elicit a diffuse, vague abdominal sensation. Upper abdominal organs such as liver, gall bladder, stomach, duodenum and spleen relay sensory impulses to the celiac plexus and from this plexus through the splanchnic nerves and rami communicantes to the dorsal cord. Vagus fibers do not transmit sensation of pain but may transmit a sensation of nausea. From the transverse colon to the rectum, nerve stimuli are gathered at the superior and inferior mesenteric and hypogastric plexuses and join the cord through the lumbar rami communicantes (Fig. 2). It is believed that cutting or burning is not a physiological stimulus and that contraction, dilatation of the viscus or muscle spasm causing acute anemia of the organs are the factors that cause spontaneous pain.

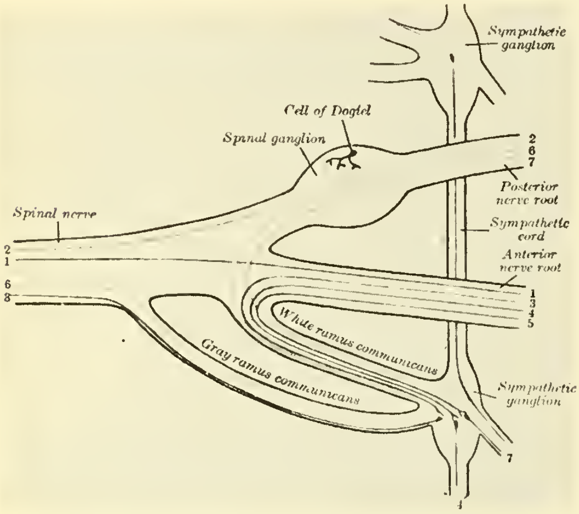

Fig. 2. Scheme showing structure of a typical spinal nerve. 1, Somatic efferent. 2, Somatic afferent. 3, 4, 5, Sympathetic efferent. 6, 7, Sympathetic afferent. (Gray's "Anatomy.")

NEURO-ANATOMY AND PHYSIOLOGY OF THE VISCERA

Previous to 1914, when Kappis first published his experiments on the splanchnic mechanism in animals, there was great controversy as to the distribution of the sensory nerve supply of the abdominal cavity and the organs contained in it. Since the brilliant work of Kappis, Neumann, Lennander, McKenzie, LeMaire, Langley and others, much information has been obtained concerning the neurophysiology of the abdominal organs. The general belief at the present time, as well summarized by Detakats,[5] illustrates the following anatomical considerations:

The great splanchnic nerve is formed by branches from the sixth to the ninth thoracic ganglia of the sympathetic trunk. It has the thickness of a match and runs on both sides of the vertebral column, passes through the crura of the diaphragm on the right side with the azygos and on the left with the hemiazygos vein and joins the celiac plexus at the level of the first and second lumbar vertebræ. The lesser splanchnic nerve originates from the tenth, eleventh and twelfth thoracic ganglia and runs parallel with the great splanchnic nerve and joins the celiac but mostly the renal and suprarenal plexuses. The two semilunar ganglia are situated above the pancreas at the level of the first lumbar vertebra; they are connected with each other by a thick network of nerve cords constituting the solar plexus from which are given off the superior gastric, phrenic, hepatic, suprarenal, renal, spermatic, ovarian, aortic and superior mesenteric, hypogastric and pelvic plexuses. This network of splanchnic fibers is situated in the loose retroperitoneal space between the vertebral column and the posterior parietal peritoneum. Fibers extend from these plexuses accompanying the blood vessels to their respective organs (Fig. 3).

The meeting place of the splanchnic nerves is at the 1st and 2nd lumbar interspace. This area can be reached from behind, called the posterior route, as advocated by Kappis, or from the front before the abdomen is opened, as advocated by Wendling,[6] or after the abdomen is opened by injecting the anesthetic solution into the retroperitoneal tissue, as introduced by Braun[7] and developed by Farr.[8] It is this method which we use in our intra-abdominal work.

Practically speaking, one may summarize in general that the peritoneum of the anterior and posterior abdominal walls, pelvis and diaphragm, the latter as far as supplied by spinal nerves, is sensitive to pain. The visceroperitoneum of the stomach, intestines, omentum, gallbladder, kidneys and liver is not painful. The fundus of the uterus is not painful to stimuli but the pedicle to the ovaries and tubes as well as the attachments of the uterus are sensitive to traction. From the work of Kappis, Lennander and others, we know that the splanchnic nerves follow the blood vessels in the mesentery. Finsterer[9] claims to have described a mesentery injection in 1912. Farr, about this time, began his anterior splanchnic anesthesia with injection of the branches of the splanchnic in the mesentery and in the posterior parietal peritoneum. He established the fact that local infiltration of the abdominal wall in the line of incision could be accomplished so as to retain the anesthesia a sufficient time for ordinary laparotomy. By injecting a small amount of the anesthetic solution retroperitoneally and by surgical strategy, he has made local anesthesia of the various organs practical. With spring retractors for holding the abdominal wall well out of the field of operation, shifting the table to bring the organs worked upon into view, gentle handling of the viscera and lack of traction, he has excluded the use of general anesthesia in most abdominal surgery. The establishment of intra-abdominal anesthesia can be accomplished by injecting the solution into the mesentery, if the bowel is to be operated upon, and the supports of the adnexa in pelvic work, or by direct splanchnic anesthesia into the posterior parietal peritoneum in the region worked upon whenever this is possible.

IMPORTANT TECHNICAL POINTS

1. Again we must emphasize that familiarity with the anatomy of the underlying structures and the general direction of the nerve supply is essential.
2. Care should be taken to keep the needle point out of the large vessels and to keep the needle in motion as the injection is being made.
3. In the establishment of mesenteric or retroperitoneal anesthesia where the branches of the splanchnic are anesthetized, the important detail to consider involves the edematization of the tissues or, in other words, ballooning it by the use of only a few cubic centimeters of the solution, keeping the needle point in view, especially when the retroperitoneal structures are edematized so that the solution is not injected into large vessels.

PREOPERATIVE MANAGEMENT

Ordinarily the patient is given a preoperative sedative in order to allay apprehension: to-wit, morphin, one-sixth grain, and scopolamin, one two-hundredths grain two hours before the operation. If very apprehensive, the dose is repeated just before the operation is started. Of recent months we have been using a hypnotic of the barbituric series in the form of sodium amytal.

CHOICE OF SOLUTIONS

There are many drugs on the market at the present. During the past five years we have been using 1 per cent novocain with the addition of 3 minims of adrenalin to the ounce.

SKIN INFILTRATION

The technic of skin infiltration and abdominal wall block will not be discussed as we are all familiar with its details without further review. But there is one point of importance which should again be mentioned. In upper abdominal work the round ligament of the liver should be anesthetized. There are many methods expounded for the establishment of abdominal wall anesthesia which are all satisfactory, including that of Labat,[10] which is a block anesthesia of the thoraco-abdominal nerves, or the establishment of anesthesia by injecting solution over the line of incision as advocated by Farr, or a paravertebral injection as advocated by Kappis and others.

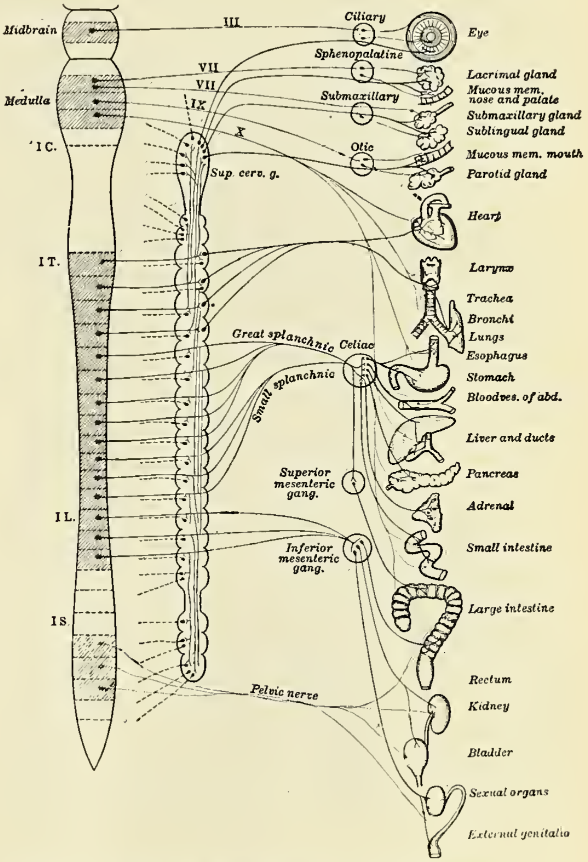
Midbrain
Medulla
I C.
I T.
I L.
I S.
III
VII
VII
IX
X
Sup. cerv. g.
Ciliary
Sphenopalatine
Submaxillary
Otic
Eye
Lacrimal gland
Mucous mem. nose and palate
Submaxillary gland
Sublingual gland
Mucous mem. mouth
Parotid gland
Heart
Larynx
Trachea
Bronchi
Lungs
Esophagus
Stomach
Bloodves. of abd.
Liver and ducts
Pancreas
Adrenal
Small intestine
Large intestine
Rectum
Kidney
Bladder
Sexual organs
External genitalia
Great splanchnic
Celiac
Small splanchnic
Superior mesenteric gang.
Inferior mesenteric gang.
Pelvic nerve

Fig. 3. Diagram of sympathetic nervous system. (Gray's "Anatomy." Modified after Meyer and Gottlieb.)

INTRA-ABDOMINAL ANESTHESIA

In cases in which intra-abdominal anesthesia is desired, a particular surgical technic must be adopted in order to painlessly manipulate organs. The strategy so often emphasized by Farr in order to eliminate traction and facilitate exposure is the keynote of success. The abdominal surgeon who successfully uses local anesthesia must be an opportunist.

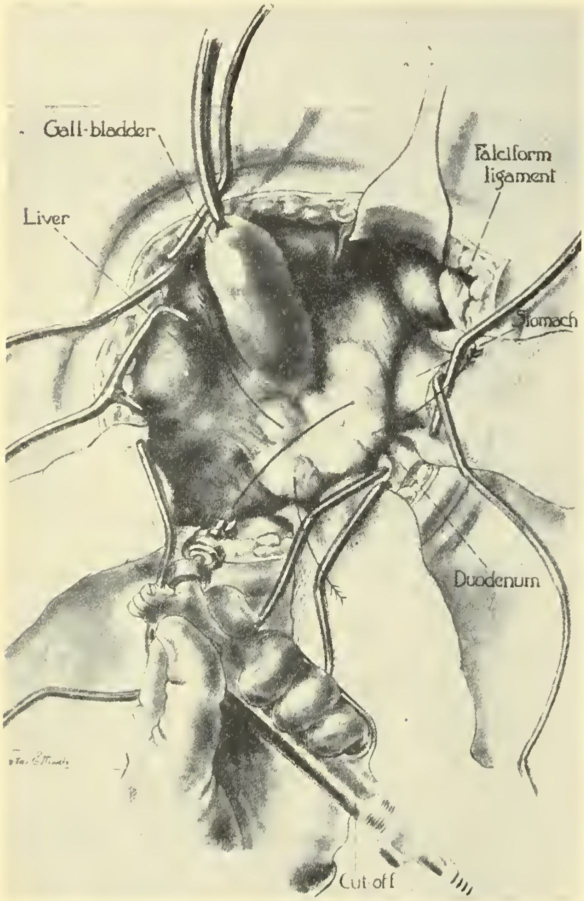

Fig. 4. Anterior splanchnic. Anesthesia technic. Surface view. Retroperitoneal injection under direct vision. Liver retracted upward, stomach and duodenum downward, giving exposure. Note anesthetic solution being introduced retroperitoneally under direct vision. (Photograph of illustration from Farr's "Practical Local Anesthesia.")

Establishment of anesthesia within the abdominal cavity is predicated upon a complete anesthesia of the abdominal wall. After the abdomen has been opened, if there is evidence of positive pressure, the anesthesia of the abdominal wall can be reinforced by injecting the solution from within outward, infiltrating the peritoneum toward the sides of the incision. This latter reinforcement of abdominal wall anesthesia is especially applicable in cases where spinal anesthesia has waned, thus completing the operation without resorting to general anesthesia.

The next important step is upward retraction in all cases so as to facilitate visualization of the organ to be worked upon in order to decrease the possibility of positive pressure and to establish splanchnic anesthesia.

RETRACTION

Proper exposure is necessary before one can begin to manipulate intra-abdominal organs painlessly. This can be accomplished by a systematic and proper introduction of automatic retractors. Routinely after the incision of the skin has been made and fascia exposed, a pair of what we call No. 2 spring retractors are placed in the fat about 1 inch from each extremity of the wound. These retractors have a point on each end which grips into the subcutaneous fat. After the peritoneum has been exposed, a larger size of the same type of retractor is placed in the wound in a like manner, retracting the fascial layers. The peritoneum is next incised and its edges held apart by one pair of No. 4 retractors which have a nonpointed loop at each end. The abdominal wall is then slowly lifted in an upward direction by a hand retractor so that the underlying organs may be exposed. Viscera can be displaced out of the operative field by the use of sponges during this procedure. The usual error committed in the placing of packs is to attempt to squeeze sponges in place without first lifting the abdominal wall.

With proper lighting and proper exposure of the known mesenteric attachments, pedicles or posterior parietal peritoneum of the area to be worked upon, splanchnic anesthesia can be started. Intraperitoneal anesthesia for some of the most practical indications for local will be discussed in detail.

APPENDECTOMY

Wherever possible, the appendix is visualized and steadied with tissue forceps while 5 or 10 c.c. of novocaine is injected into the mesoappendix. If traction on the cecum is imperative, its peritoneal attachment is ballooned up with 5 or 10 c.c. of the solution in order to establish a cecal block. In cases where the appendix is not visualized immediately, gentle manipulation with the fingers can usually locate its whereabouts and with careful packing of the surrounding viscera with moist packs, in most cases either a portion of the appendix can be brought to view or at least the cecum can be isolated so that the solution can be injected either into the mesenteric attachment or mesoappendix. The same technic applies for a cecostomy or ileostomy.

Pelvic Operations.—The round ligaments should be injected first when possible and the important point to remember is that the outer lower ends next to the peritoneal attachment are the imporant locations to be edematized with the anesthetic solution. Many operators are oblivious to this detail and repeatedly inject the solution next to the uterus rather than out near the peritoneal attachment. The ovarian and tubal pedicles and broad ligaments are then infiltrated if traction is anticipated. And wherever possible, the posterior peritoneum over the promontory of the sacrum should be exposed and anterior splanchnic anesthesia of the sacral splanchnics should be done, preferably bilaterally just beside the promontory in order not to make a vascular injection. If abdominal hysterectomy is contemplated, the above anesthesia is complemented by subperitoneal infiltration about the uterine cervix. The region of the uterine arteries is especially sensitive and a small amount of solution should be deposited in the perivascular tissue just before clamps are applied. In blocking for a panhysterectomy, the same technic as for subtotal hysterectomy is employed except that the tissues between the bladder and cervix in front and the rectum and cervix behind must be thoroughly infiltrated.

The Ovary.—The normal ovary is not particularly sensitive. However, traction should be avoided and the ovarian pedicle injected but in case of large ovarian cysts or adherent cysts, it is often difficult to inject the pedicle. In such instances, the cyst may be evacuated before delivery is attempted and suction in the cyst applied immediately in order to obviate the dissemination of possible malignant particles. Once the cyst is reduced in size, the pedicle can easily be blocked.

Cesarean section, although very infrequently done under local anesthesia, can be accomplished by simple infiltration of the abdominal wall and the avoidance of delivery of the uterus. The uterine wall is not senstive.

Upper Abdominal Operations.—Operations on the stomach lend themselves particularly to local anesthesia because of the ease of access and unusually long mesentery, the exception being infiltrating ulcers in the region of the pylorus. There is no pain in suturing, burning or cutting of the stomach. In these cases, the round ligament of the liver is blocked before the incision is made. The splanchnic region is exposed by gentle upward traction of the liver edge and the pylorus gently drawn downward. About 10 to 15 c.c.'s of the solution is introduced beneath the peritoneum in order to block the underlying splanchnics which come through with the blood vessels. The gastrohepatic omentum is ballooned up with the solution before it is divided. The sides of the large vessels are also edematized in order to anesthetize the finer splanchnic branches. Usually, clamps are avoided in order to lessen the possibility of traction. Local anesthesia in stomach operations finds its chief value because of the lessening of the possibility of operative nausea. Operations such as resections, pylorectomies and gastroenterostomies can be performed by the above technic. Gastrostomy needs no intra-abdominal anesthesia.

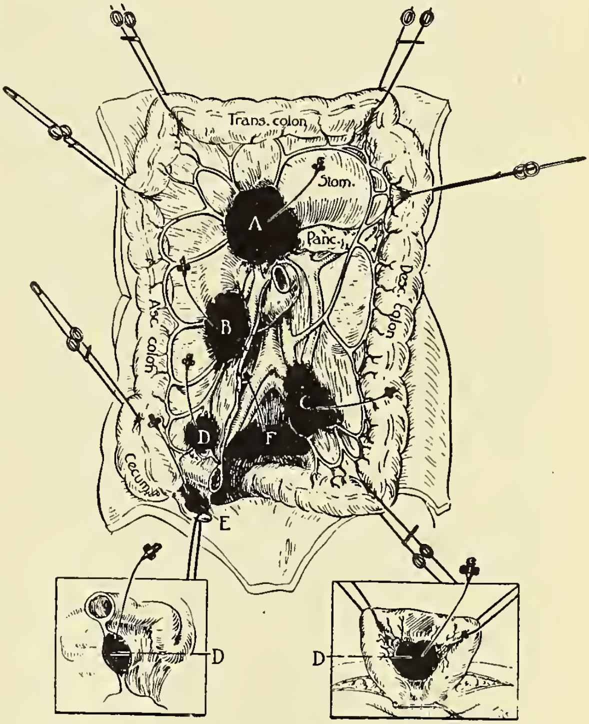

Fig. 5. The abdominal sympathetic system. Surface view. Colon eviscerated. Darkened areas show subperitoneal infiltration. A mesenteric anesthesia of transverse colon; B, mesenteric anesthesia of ascending colon; C, mesenteric anesthesia of descending colon; D, mesenteric anesthesia of small intestines; E, mesenteric anesthesia of appendix; F, anesthesia of pelvic sympathetics at pelvic brim. (Photograph of illustration from Farr's "Practical Local Anesthesia.")

Gallbladder Operations.—Gallbladder drainage can be done satisfactorily without intra-abdominal anesthesia. When the gallbladder is to be drained for stones or the ducts scooped, sympathetic anesthesia is indicated and is accomplished by infiltrating the tissues around the cystic and common ducts with a few c.c. of the solution. If cholecystectomy is anticipated, the solution is injected beneath the peritoneal coat of the gallbladder close to the liver edge and the dissection usually started at the fundus. By the time the operation has proceeded to the region of the cystic or common duct, splanchnic anesthesia has had a chance to disseminate. Cholecystectomy is not difficult if there are no adhesions and not much inflammation. In such cases, one must be especially patient and infiltrate as the dissection proceeds from the fundus towards the ducts. As the dissection proceeds downward, one can sight the region of the cystic or common duct and introduce the solution into the retroperitoneal area in order to establish a splanchnic anesthesia. The usual mistake is to proceed with the dissection rather than waiting a few minutes to give the solution time to disseminate. If traction is necessary in high-lying livers and in obese individuals where splanchnic anesthesia cannot be established satisfactorily, it would be advisable to supplement local injection by inhalation anesthesia. However, with good exposure and attention to details and technic, this contingency is very rare (Fig. 4).

The Bowel.—Before traction is applied, the mesenteric attachment of the large bowel is infiltrated along the region of the large vessels especially, keeping the needle point in view while the mesentery is being edematized (Fig. 5).

Exploratory Operations.—In cases of malignancy where doubt of operability exists, an exploration under general is often an operation of magnitude on account of the depleted condition of the patient, while with local it is no more than an inconvenience. Therefore, local anesthesia is applicable especially to exclude or confirm a certain condition by the exploratory method. However, with satisfactory abdominal wall anesthesia and a small amount of inhalation anesthesia, a most complete exploration can be done as indicated.

SUMMARY

1. Local anesthesia for intra-abdominal operations is definitely applicable in cases where general or spinal is contraindicated, in cases of spinal anesthesia where the anesthesia has waned, and is the method of choice in major abdominal procedures in all cases of prolonged debility from disease, and in the aged.

2. Familiarity with the anatomy, and particularly the neuro-anatomy, of the field of operation is essential before one attempts to adopt this method.

3. Sympathetic anesthesia can be established by injecting the solution into the mesenteries, adnexal supports, subperitoneally and perivascularly.

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PRIMARY CARCINOMA OF THE BRONCHUS: REPORT OF SEVENTY-ONE CASES IN WHICH THE DIAGNOSIS WAS MADE BY BRONCHOSCOPIC EXAMINATION*

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MALIGNANT tumors in any part of the body are often associated with secondary growths in the lungs. This is particularly true if the malignant process originates in the breast, thyroid gland or kidney. Primary malignant growths in the lung, which usually arise in one of the larger bronchi, are much less commonly observed, and until the last decade were considered rare.

In the last five years, however, there has been a rather rapid increase in the number of such cases reported in the literature; the cases have been observed at postmortem and on clinical and bronchoscopic examination. Increasing use of the bronchoscope in the study of pulmonary disease has added much to knowledge of the early manifestation of primary bronchial malignant conditions, and accurate diagnosis and appropriate treatment have resulted.

I shall review here seventy-one cases of malignant disease of the lung observed from May, 1925, to January, 1931, in which diagnosis was made by the microscopic study of tissue removed from the lumen of the bronchus at bronchoscopic examination. It is hardly necessary to record that these patients were examined under local anesthesia with a minimal amount of discomfort, and that tissue was removed without any untoward results.

Fifty-seven of the patients were men and fourteen were women. Three patients were aged from twenty to twenty-nine years; eight from thirty to thirty-nine; nineteen from forty to forty-nine; twenty-four from fifty to fifty-nine; sixteen from sixty to sixty-nine, and one patient was aged seventy-two years.

It is manifestly impossible to determine the cause of malignant disease in the bronchus or to explain the evident increase in the incidence of the lesion. It is true that many of my patients had had prolonged respiratory symptoms that were probably the result of chronic bronchiectasis, and one might conclude that local irritation was a factor in the production of the lesion. Tuberculous disease of the lungs, which has been thought to be a causative factor in malignant disease of the bronchus, had been present previously in two cases only, and preceding respiratory disease, including influenza, had been noted in forty-seven cases. Less than half of the patients (thirty-two) were smokers, and only a few smoked to excess. Eight patients gave a family history of carcinoma.

The symptoms of carcinoma of the bronchus may simulate those associated with any pulmonary disease. In many instances symptoms had been present so long that a malignant lesion was not suspected until it was discovered through the bronchoscope. Even then, it could not be distinguished from inflammatory disease in the bronchus until tissue was studied under the microscope. The symptoms referable to the respiratory tract had been present for periods ranging from ten weeks to forty years. One would expect every patient suffering from a new growth in the bronchus to cough, and yet five patients did not cough. One patient had never had any pulmonary symptoms and had come for examination because of weakness, loss of weight and pain in the legs. Sixty of the patients had had sputum, frequently purulent in character, associated with the cough. Forty-three patients had expectorated sputum containing blood in varying amounts. Dyspnea was rather marked in certain cases and seemed to be out of proportion to the amount of lung obstructed by the growth; it was present in forty-nine of the seventy-one cases of this series.

Pain in the thorax was a most disturbing symptom, and was noted by forty-seven patients. Sixty-two patients had lost weight but two had actually gained weight during the course of the disease. Stridor was present even when the lesion was situated well beyond the bifurcation of the trachea; it was noted in twenty-three of the patients. Partial blocking of a bronchus invariably results, with suppuration, and symptoms and signs produced by new growths in the bronchus are often thought to be caused by bronchiectasis or abscess. This was especially noticeable in my series of patients, as thirty-eight had had fever, ten had noted chills, five had clubbing of the fingers and thirty-one had leukocytes numbering more than 10,000. The hemoglobin of thirty-five patients was less than 70 per cent. Extension into the pleura with the development of pleural effusion is common in these cases, but in the cases of my series a diagnosis was made relatively early and the complication was observed in six cases only. In two of these the fluid was clear, in two it was blood-stained and in two pus was found in the pleural cavity.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

Carcinomas arising in a bronchus usually produce obstruction to the lumen of the tube and limit the entrance of air into the lung beyond the stenosed area. Bronchostenosis was present in fifty-three cases and was the most frequently observed physical sign. Stenosis of the bronchus may be confused with thickening of the pleura or pleural effusion, but in the former the percussion note is not greatly impaired, whereas, in the latter, dulness or flatness is present.

Metastasis was definite in ten cases, and questionable in one case; it was usually observed in the cervical lymph nodes but was noted in the orbital cavity in two cases and in bones in three. The recurrent laryngeal nerve was involved, with resulting paralysis of the vocal cord, in four cases. Although malignant disease metastasizing to the lungs from other organs rarely produces the signs and symptoms of primary malignant disease in the bronchus, one must always consider the lesion in the bronchus to be secondary to an extrapulmonary growth.

One patient had had a hypernephroma removed eight years previously, one had had carcinoma of the bladder two years before the onset of the pulmonary lesion, and a third patient had had carcinoma of the uterus two years before the bronchial growth appeared. None of the tissue removed from the bronchial lesion resembled that of the original growth.

Roentgenographic examination of the thorax revealed evidence of a lesion in the lung in sixty-nine cases; in the other two cases the examination was considered negative. In thirty-two cases the lesion observed was thought to be inflammatory, and in one case the shadow in the roentgenogram was thought to be due to benign tumor. In thirty-six cases a roentgen diagnosis was made of primary malignant disease in the bronchus; the diagnosis was based on infiltration near the hilum of the lung extending toward the periphery as a fan-shaped lesion that is usually associated with partial pulmonary atelectasis.

Although bronchoscopy offers the most accurate method of early diagnosis of malignant disease of the bronchus, I have not been able to obtain positive evidence in about a third of the cases suspected of being malignant, because the lesion was in an inaccessible portion of the bronchial tree, or the infiltration was not associated with ulceration and a satisfactory piece of tissue could not be obtained. In many cases, negative bronchoscopic data can be explained by an erroneous clinical diagnosis. One should not hesitate to remove tissue from an infiltrating lesion in the bronchus if a malignant process is suspected, for in many instances the lesion cannot be distinguished from inflammatory disease without microscopic study of a portion of the growth.

In seventy of the cases, the diagnosis of malignant disease of the bronchus was made at the first bronchoscopic examination. In the remaining case, the patient was rather intolerant to the examination and the lesion in the bronchus to the lower lobe of the left lung was not detected until several months later, when another bronchoscopic examination was made.

In a considerable number of cases the clinical history and the general and roentgenographic data suggested the presence of bronchial malignancy, and at bronchoscopy the gross picture was similar to malignant infiltration, but tissue removed from the lesion was inflammatory, and subsequent developments have proved that the character of the disease was benign. This condition has been noted especially in cases of unsuspected foreign body of intrapulmonary or extrapulmonary origin. In certain cases in which tuberculosis involved the base of a lung the condition simulated malignant disease of the bronchus, but usually there was absence of bronchial ulceration, although in a few cases the differential diagnosis could not be made until tissue removed from the bronchus had been examined microscopically. On bronchoscopic examination, the growth can be located exactly. On the right side, the lesions were in the bronchus to the lower lobe in twenty-three cases, in the main bronchus in twenty-one and in the middle and upper lobes in two each. On the left side, the lesions were in the main bronchus in twelve cases, in the bronchus to the lower lobe in seven and in the bronchus to the upper lobe in three. In one case there was diffuse carcinomatous infiltration of the trachea and bronchi, and in another the lesion was in the trachea alone. Tissue removed from the bronchus was examined and graded according to the method of Broders. In forty cases the lesion was squamous-cell epithelioma; twenty-seven of these lesions were graded 4, twelve were graded 3 and one lesion was graded 2. In twenty-six cases the lesion was adenocarcinoma; eleven were graded 4, twelve were graded 3, one lesion was graded 2 and two lesions were graded 1. Carcinoma was graded 4 in two cases and 3 in one case. In one case the lesion was regarded as lymphosarcoma and another was not graded because a sufficient amount of tissue was not obtained for examination.

Although the prognosis in primary malignant disease of the bronchus is regarded as hopeless, one should always advise the use of radium or deep roentgen rays, except in cases in which the general condition of the patient does not permit any type of treatment. Forty-two of the patients in this series were treated with radium or roentgen rays, and as practically all were advised to have treatment, it is possible that others were treated after returning to their homes.

Ten patients were living and considered their condition much improved or cured for an average of fifteen months after a diagnosis was made at the clinic. All of these had had radium or roentgen-ray exposures, or both. Seven were failing after an average duration of life of seven months following a diagnosis, and two of these had been treated. Fifty-four patients died after an average life of six and a half months; thirty of these had been treated. Although the results of treatment could not be classified as brilliant, the fact that the condition of ten patients is improved or cured after radium or roentgen-ray exposure, one patient for four years, justifies the employment of such treatment whenever possible. At present, the operative treatment of malignant growth of the bronchus is hardly justifiable.

CONCLUSIONS

1. Primary malignant disease of the bronchus is not rare.
2. Any infiltration at the hilum or base of the lung may be the result of malignant disease.
3. Pulmonary symptoms are usually present, but in some cases they may be mild or absent.
4. Bronchostenosis is the most frequently observed physical sign of the disease.
5. Patients suffering from malignant growths in the bronchus have had pulmonary symptoms for many years, and it is possible that prolonged pulmonary suppuration may predispose to the development of carcinoma.
6. Bronchoscopy offers the only means of making a relatively early and accurate diagnosis of the presence of a malignant lesion of the bronchus, and is usually indicated in chronic pulmonary disease if tuberculosis is an unlikely etiologic factor.
7. Radium and roentgen-ray treatment has been followed by beneficial results and should be employed unless contraindicated by extensive metastasis or extreme weakness.

REVIEW OF NON-TUBERCULOUS CASES ORIGINALLY DIAGNOSED PULMONARY TUBERCULOSIS*

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A STUDY of adult patients sent to this Sanatorium with a diagnosis of pulmonary tuberculosis and subsequently found to be non-tuberculous was made. All patients, with a few exceptions, who are admitted, enter with a diagnosis of some form of tuberculosis. During the past five years 2,429 patients have been admitted and 2,096, or 86 per cent, had pulmonary tuberculosis. This brief study was undertaken primarily to obtain a statistical picture of the incidence and types of non-tuberculous patients encountered; and secondarily, to offer a few remarks on the problems of differential diagnosis which this review might bring to light.

About 12 per cent of pulmonary cases receive a so-called "deferred" diagnosis on admission. By this is meant that there is insufficient evidence at the time to warrant a diagnosis of tuberculosis, and implies that further study and observation will be necessary. Many of these individuals with a clinical history suggestive of tuberculosis, but with few objective findings, require several months of observation before a non-tuberculous diagnosis is justified.

In classifying these cases we use the scheme adopted by the National Sanatorium Association.[1] Diagnostic standards given for non-tuberculous cases are as follows:

1. No persistent râles in the upper half of the chest.
2. X-ray negative or showing a slight peritruncal lesion.
3. Tubercle bacilli never found in sputum.
4. Complement fixation test for tuberculosis, positive or negative.
5. No constitutional or focal reaction to the subcutaneous tuberculin test after the injection of 10.0 Mg. of Old Tuberculin once repeated. (Scale of doses—0.0001; 0.001; 0.003; 0.005; 0.01; 0.01.)
6. Constitutional reaction to the subcutaneous tuberculin test of 10 Mg. or upon repetition without focal reaction as determined by physical signs (râles) or X-rays.
7. No history of unexplained hemoptysis of a teaspoonful or more.
8. No history of unexplained pleurisy with effusion.

The group which is designated as "suspected tuberculosis" follows the above classification except that either No. 7 or 8 may be positive but not both. ("Suspects" were not classified separately, but were included under the deferred diagnosis group.)

A third group which we should at least mention are the "non-clinical" cases. They conform to the classification given for non-tuberculous cases with one exception, viz.: No. 2 reads "Parenchymal X-ray lesion not explainable by other causes." Serial chest films are of especial value here in determining whether active tuberculosis exists. Patients with non-clinical tuberculosis frequently come in with symptoms which have been falsely explained by the X-ray film. Sixty-nine cases of non-clinical tuberculosis have been sent in during the past five years, many of them with minor non-tuberculous complications which accounted for their symptoms.

TABLE I

CASES ADMITTED WITH DIAGNOSIS OF PULMONARY TUBERCULOSIS

1925-1929

Diagnosis	No.	Per cent
Pulmonary tuberculosis	1943	92.7
Non-clinical tuberculosis	69	3.3
Non-tuberculous	74	3.6
Indeterminate	10	.4
Total	2096	100.0

In Table I we see that 74, or 3.6 per cent, of the patients sent to the Sanatorium were found to be non-tuberculous. The percentage given for similar cases by other sanatoria agree closely with this figure. Various authors, among them Rist and Hamilton,[2] have felt that sanatoria often unwittingly harbor many cases not suffering from tuberculosis. This, however, is not true at present, with the improved diagnostic aids coupled with the rigid diagnostic standards

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*From the Glen Lake Sanatorium, Oak Terrace, Minnesota. Read before the Monthly Staff Meeting of Glen Lake Sanatorium, May 19, 1930.

TABLE II

COMPARISON OF ADMISSION AND DISCHARGE DIAGNOSIS MADE AT SANATORIUM

Non-Clinical Cases		No.	Per cent	Non-Tuberculous Cases		No.	Per cent
Adm. Diag.	Pulmonary Tb.	26	38	Adm. Diag.	Pulmonary Tb.	6	8
	Non-clinical Tb.	10	15		Non-clinical	6	8
	Deferred	33	47		Non-tuberculous	2	4
					Deferred	60	80
Disch. Diag.	Non-clinical	69	100	Disch. Diag.	Non-tuberculous	74	100

exacted before diagnosis is made. The indeterminate group includes patients who deserted or were transferred to other institutions before studies were completed.

Table II gives a comparison between the admission diagnosis made here and the final diagnosis. It shows what changes the diagnoses went through and intimates that a quick diagnosis was not easy, it being necessary to defer judgment on most of these patients on admission. Many of them required three months or more of study before an opinion could be given with reasonable certainty.

In diagnosing tuberculosis, Pottinger[3] states that, "the first and most important point in the diagnosis of phthisis is to know when to suspect it." Once we suspect it, diagnosis is usually not so difficult, especially with the aid of the characteristic changes seen on the roentgenogram. The routine use of chest roentgenograms in general physical examination cannot be too strongly recommended. There is, however, a group of patients in whom little evidence can be found to support a diagnosis of phthisis from a clinical or roentgenological standpoint, yet for want of a better diagnosis these individuals are often "threatened with tuberculosis." It is this group which have long offered a real diagnostic problem and which make up the bulk of non-tuberculous cases sent to us. Such patients may have lost some weight, may have a slight temperature and so on the basis of such symptoms, plus a positive skin test, he or she is often branded as tuberculous.

In regard to these obscure cases we may paraphrase Pottinger's remark and say that here the important point is to know when to allow clinical evidence to divert our minds away from tuberculosis. It is in these patients that a thorough search should be made for the presence of some chronic or acute non-tuberculous lung infection or extra-pulmonary pathology which would explain the patient's symptoms. Failing in this, tuberculosis then may have to be re-considered; and finally it is quite possible that the patient may have no organic disorder whatever.

While one should never lose sight of the possibility of tuberculosis, it is a serious mistake to wrongly diagnose an individual as tuberculous. That it may handicap the patient both socially and physically cannot be denied. We all know that there are still people who have an exaggerated fear of anyone who has been branded as a "consumptive." And also, the possibility of making a "neuro" out of a certain number of these people exists. There are some who enjoy poor health and are able to adjust themselves nicely to fit such a diagnosis. There are others who become confirmed hypochondriacs, because of their supposed tuberculosis.

TABLE III

NON-TUBERCULOUS GROUPS

Classification	No.	Per cent
1. Apparently normal	23	28
2. Misc. extra-pulmonary conditions	29	41
3. Pulmonary disease	22	31
	74	100

We divided the non-tuberculous series into three groups as may be seen in Table III. The first group we found a bit hard to classify and we may be criticized for terming them "apparently normal." Probably some of these individuals should have received a diagnosis of nervous exhaustion or instability. Many of them gave a history of having an upper respiratory infection but usually little or no tangible evidence of respiratory disease was found. Their symptoms were much the same. They gave a history of tiring easily, general malaise, slight loss of weight and probably a dry cough; some also complained of chest pains and a slight temperature rise. In none of these individuals were any one of Brown's diagnostic points[4] fulfilled.

We do not overlook the fact that many such patients have tuberculous infection and may develop tuberculous disease later in life. Such patients, especially in the teen-age group, we should warn as to the future; but we are not justified in making a diagnosis of tuberculous disease with the evidence at hand. The majority of these individuals, many of them of the nervous, high-strung type, were found to have been living outside of their physical income and were simply tired and in a so-called run-down physical condition. They usually responded to a short period of physical and mental relaxation and later to sensible living habits.

The above condition has been described by various writers as an entity, it being termed occult tuberculosis, the tired sickness, concealed tuberculosis, etc. Some authors[5, 6] have attempted to classify these individuals as tuberculous on the basis of vague symptoms plus a constitutional or local reaction following the use of tuberculin. Making a diagnosis of tuberculous disease on such meager evidence is seldom if ever warranted.[7] Masked tuberculosis such as Norris and Landis[8] describe no doubt exists but making such a fine diagnosis with our present diagnostic aids is rather precarious. (We have had no experience with the diagnosis of pre-clinical tubercle in suspects by the Caulfield Inhibitive and T.C.F. reactions as advocated by Odgen.[9]) These individuals require painstaking and frequent examinations and prolonged observation before an opinion can be given. And then it must be admitted that a certain number of these under-par individuals resist diagnosis in spite of employing all of our diagnostic weapons. This latter class are most annoying but usually survive their physicians.

We next consider the extra-pulmonary group. Among them we find conditions which give a clinical picture of nervous and physical exhaustion, as does tuberculosis. Some of them which may simulate an early tuberculous process are: heart disease, intestinal disorders, syphilis,[10] hyperthyroidism, neurasthenia, and mouth and upper respiratory infections. Among the latter chronic latent sinusitis[11] especially deserves mention.

TABLE IV

MISCELLANEOUS EXTRA PULMONARY CONDITIONS

Diagnosis	No.	Per cent
Heart disease	8	27
Intestinal disorders	5	17
Syphilis	4	14
Upper respiratory infections	4	14
Carcinoma (esophagus) (larynx)	2	7
Arthritis	2	7
Hodgkin's	1	3.5
Hyperthyroidism	1	3.5
Actinomycosis (rib)	1	3.5
Pregnancy	1	3.5
Total	29	100

Heart disease predominated in this group with intestinal disorders ranking second (Table IV). Both functional and organic conditions were included in the latter. There were two instances of gastric ulcer. In many of these patients the underlying pathological process had given rise to few localizing symptoms so attention was not directed to it.

TABLE V

NON-TUBERCULOUS PULMONARY INFECTIONS

Diagnosis	No.	Per cent
Bronchiectasis	11	50
Bronchitis	5	23
Pulmonary abscess	2	9
Asthma	1	4.5
Empyema (non-tbc.)	1	4.5
Blastomycosis	1	4.5
Pulmonary fibrosis	1	4.5
Total	22	100.

The third and last group includes the pulmonary infections of non-tuberculous origin. Bronchiectasis was by far the most frequently encountered, with bronchitis and pulmonary abscess next in order (Table V). Bronchiectasis is frequently misdiagnosed as tuberculosis or chronic bronchitis. According to Ochsner[12] the majority of so-called bronchitis patients really have bronchiectasis. It is interesting to note that there are no cases of pulmonary malignancy in this group; in fact we have had only one case of primary pulmonary malignancy on record in a total of approximately 4,400 admissions.

In recent years suppurative pneumonitis, lung abscess and bronchiectasis have been less frequently confused with tuberculosis. Alexander[13] states that this increasing accuracy in the diagnosis of these lesions is due to "the use of iodized oil pneumograms and bronchoscopy together with a better appreciation of the etiologic factors and the tremendous value of the patient's medical history."

The value of bronchograms or pneumograms deserves special emphasis. Frequently we have patients with many clinical signs of phthisis including a productive cough but no X-ray evidence on the ordinary chest plate. In these bronchography often reveals an early bronchiectasis.

The value of a complete sputum study should also be stressed. A bacteriological examination of the sputum too often ends when no tubercle bacilli are found. It should go farther. The sputum of bronchiectasis, lung abscess, the bronchomycoses,[15] fuso-spirochetal disease,[16] asthma, etc., all tell their own story and frequently bring to light the true diagnosis.

The incidence of upper respiratory disease among the non-tuberculous lung infections is not dealt with in this paper. Suffice it to say that infections of nasal accessory sinuses were almost invariably found and appeared to be a predisposing factor in many cases, as Dunham[14] and others have pointed out.

TABLE VI

TABULATION OF LEADING SYMPTOMS GIVEN BY ALL NON-TUBERCULOUS GROUPS

Symptom	No.
Tiredness or weakness	22
Dry cough	20
Productive cough	13
Slight temperature	14
Chest pains	10
Bloody sputum	9
X-ray evidence of tb.	9
Loss of weight	8
Night sweats	6
Frequent colds	3
Bronchitis	3
Positive tuberculin test	2

A tabulation of the symptoms or findings which apparently prompted sending these patients to the sanatorium was made from the admission history. In most cases two symptoms were chosen, and in some instances only one was considered necessary to record, *e.g.*, X-ray changes supposedly tuberculous in origin. It is apparent from Table VI that a history suggestive of respiratory disease was obtained in most cases, yet in only one-third of the series was any lung or upper respiratory disease found.

COMMENT

The number of non-tuberculous patients sent to this sanatorium has been low. About two-thirds of them showed some sign of disease. A number of patients apparently were diagnosed tuberculosis merely on a "hunch" gained chiefly from the under-par appearance of the patient coupled with the absence of any demonstrable extra-pulmonary disease. While it is probably better to err on the safe side, yet a diagnosis in the absence of positive findings is seldom, if ever, justified.

Where and how to study these borderline cases is largely an individual problem, which in turn is dependent on available facilities for observation. Institutional care and study would be ideal in most cases, but this is impracticable, and so it usually devolves upon the general practitioner to render the important verdict: tuberculous or non-tuberculous.

SUMMARY

1. Among 2,096 consecutive cases sent to Glen Lake Sanatorium for pulmonary tuberculosis 74, or 3.6 per cent, were found to be non-tuberculous.
2. Classification of non-tuberculous patients:
    a. Twenty-eight per cent were classed as apparently normal.
    b. Forty-one per cent had miscellaneous extra-pulmonary disease, with heart disease first, and intestinal disorders second.
    c. Thirty-one per cent had non-tuberculous lung infections with bronchiectasis predominating.

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HEALTH BUILDER NOT ACCEPTABLE

The Council on Physical Therapy reports that the Health Builder of the Sanitarium Equipment Co., Battle Creek, Mich., is claimed to be a "mechanical means of administering massage and vibratory exercise." It consists essentially of an electric motor driving an oscillating mechanism which transmits a vibratory motion by means of a belt, or applicator, to the user. The Council finds the Health Builder unacceptable for inclusion in its list of accepted devices for physical therapy because the firm advertises claims that are misleading, exaggerated or unwarranted; because the advertising and descriptive matter fails to give adequate warning of the dangers associated with its use; and because the firm uses an objectionable name for the apparatus. (Jour. A. M. A., November 14, 1931, p. 1466.)

MEAD'S BREWER'S YEAST

In the announcement of acceptance of Mead's Powdered Brewer's Yeast by the Council on Pharmacy and Chemistry (Jour. A. M. A., May 2, 1931, p. 1477) it was erroneously stated that this product assays approximately 1 vitamin B_2 (G unit) per Gm. It should have read 10 instead of 1. It was also erroneously stated that the unit of vitamin B_1 used for that amount of substance which, added to the diet of rats showing symptoms induced by deficiency of B_1 (F) would give an average weekly gain in weight of 3 Gm. for eight weeks. This should have read 11 to 14 Gm. instead of 3 Gm. Another error was that the product offers not less than 0.98 unit of vitamin B_2 (G) per gram. This should have read 10 units instead of 0.98 unit. (Jour. A. M. A., July 11, 1931, p. 103.)

THE SIGNIFICANCE OF INFRACLAVICULAR PULMONARY TUBERCULOSIS

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THE old doctrine and time-honored teaching that pulmonary tuberculosis almost invariably begins at the apex has, in the past eight years, been replaced by the concept of non-apical or infraclavicular infiltration as the initial adult lesion or true incipient tuberculosis. The opening shots at the old teaching came from two sources: 1. The significance, prognostic and clinical, of apical lesions was studied. Braeuning, in a study of patients with apical tuberculosis over a period of seven years, showed that only 7.8 per cent had developed progressive disease. He also showed that only thirteen per cent of his patients with positive sputum gave a history of apical tuberculosis. This report was startling, because it showed that the percentage of cases which progressed from apical to open tuberculosis was lower than the entire mortality from tuberculosis. Similar evidence was presented by Lydtin and Romberg, Redeker and Walter, Kayser-Peterson and others.

2. The actual beginning of progressive destructive tuberculosis was studied. Haudek, drawing from his extensive roentgenological experience, shows that apical lesions usually do not progress; that strictly apical cavities are rare. He, as well as Redeker, states that he has never seen the roentgenological pictures of a fibrocaseous bronchogenic tuberculosis develop from an apical focus.

With all of this strong evidence against apical lesions as the incipient stage of tuberculosis in mind, how then does tuberculosis start? This question was answered in the work of Assmann, Redeker, Wessler, Fishberg, Rhomberg, Ulrici and other prominent investigators, on the basis of the infraclavicular infiltrate as the truly incipient stage of pulmonary tuberculosis.

Before going further, I wish to recall to your minds the work of Ranke, his theory and classification of tuberculosis, and the modifications made by Redeker, which must be understood to appreciate the "new doctrine."

Ranke's three stage classification, with certain modifications, is now almost universally accepted by leading clinicians. He distinguishes three stages in tuberculosis, each one characterized by a different phase of immunity with different modes of propagation of the infection. The first stage is that which is now known as childhood tuberculosis, and includes the site of the first infection, often a Gohn tubercle, and the regional lymph nodes. It is marked by a profound change of all the tissue cells, developing after the first infection what is known as allergy. The tubercle bacilli with the highly irritating lipins contained in the envelope of the bacterium are treated by the body as any foreign body, that is, they are walled off and set apart from normal tissue. Owing to the avascularity of the tubercle, the infection is propagated mainly by the lymph vessels. At this stage the disease is therefore predominately a tuberculous lymphadenitis. Ranke's second stage begins with the first reinoculation of the allergic body. All of the tissue cells have become sensitized and the reaction is a prompt and intense local and general allergic response. The anatomical picture is that of acute inflammation with hyperemia, edema, and emigration of lymphocytes. During this stage, the infection spreads mainly through the blood stream, although other channels are open. This stage is therefore characterized by hypersensitiveness to reinfecting bacilli, by acute inflammation and by distant hematogenous metastasis. The third stage is characterized by a relative anergy and by propagation of the disease through continuity or through the visceral body ducts. This is his last and final stage and in his opinion a return to the second or primary state of allergy is impossible. Redeker points out that so rigid a classification would not account for the cyclic nature of tuberculosis. He states that the order in which the three stages follow each other, from the first infection to death or cure, is reversible as to time; and that a return to a preceding phase, particularly from the third to the second, is quite common. After the first stage, the majority of cases show alternating periods of hypersensitiveness and comparative anergy, corresponding to periods of activity and quiescence. It is plain to see that the second stage represents the most critical period in a patient's life and that the duration and degree of allergy decide his fate. The appearance, duration and intensity of the second phase of allergy depend not only upon the virulence and size of the reinfecting dose, but to a great extent on non-specific factors, as intercurrent disease, age, pregnancy, trauma and the influence of the endocrine and autonomic nervous systems.

On the basis of Ranke's conception, the isolated bronchopneumonic foci as described by Assmann, could have been foreseen. The new focus of reinfection must of necessity be inflammatory in character and could be localized in any portion of the lung to which the bacilli could gain access, either by inhaled air or by the lymph or the blood stream from an old lesion.

The new German school contends that pulmonary tuberculosis nearly always begins with a broncho-pneumonic focus in some part of the lung below the clavicle, from where it spreads by the formation of new foci to the mid-lung and the base, involving the apices at a much later period. They believe that, while late apical tuberculosis is common, incipient apical tuberculosis is extremely rare. The present diagnosis of incipient tuberculosis localized in the apices is in reality a false, late diagnosis and our treatment, not early but delayed.

In a study of 117 early infiltrates, Redeker reported the localization as infraclavicular in 58, mid-field in 38, lower field in 15, sub-clavicular in 4 and apical in 2 cases. They are described as soft, cloudy, homogeneous shadows, the size of a cherry to that of a plum, surrounded by normal lung tissue. The physical signs are usually very indefinite or entirely lacking. The subjective symptoms are equally insignificant.

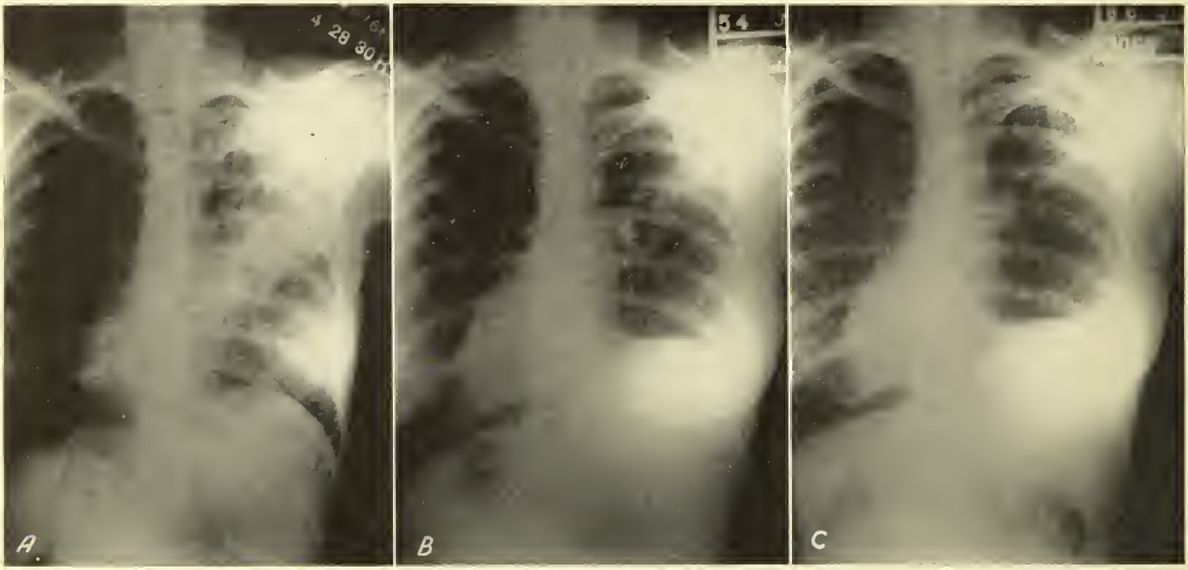

Fig. 1. Infra-clavicular lesion showing progress following early phrenic exeresis. View *A* was taken April 28, 1930; *B*, May 4, 1931; *C*, August 6, 1931.

The subject of the early infiltrate versus insidious apical tuberculosis was thoroughly studied, correlating the history of the patient with the findings on his first available X-ray plate, by Douglas, Pinner and Wolepor. From this study and that of Redeker, Assmann and other well known authorities, the following conclusions have been drawn:

1. That the "new doctrine," of which Redeker is the foremost exponent, is supported by statistical and clinical data.

2. Pulmonary tuberculosis most often begins with non-apical infiltrations, which are characterized by their instability and may progress or retrogress in a very short time.

3. Apical tuberculosis is usually a benign late form, not an occurrence of incipiency, and that rarely does an apical lesion give rise to progressive disease.

4. Progressive and destructive pulmonary

tuberculosis usually starts suddenly with exudative subapical lesions.

5. Lesions may become far advanced and cavitation develop in less than 6 months.

6. Processes leading to active progression and cavitation are usually associated with acute symptoms.

7. The physical signs and symptomatology traditionally described as characteristic for "incipient pulmonary tuberculosis," are misleading for the detection of truly incipient subapical acute processes.

8. Roentgen examination is the only method by which we can exclude pulmonary tuberculosis, which begins with non-apical infiltrates. Radiography of the chest should be used as a routine method.

9. Surgical collapse should be attempted in the treatment of infiltrates that do not retrogress spontaneously in a short time.

10. During the allergic phase, general and functional rest are strongly indicated, whereas the use of stimulating therapy, such as tuberculin, exercise, and heliotherapy, must be opposed.

11. Every effort should be made to diagnose acute infiltrations and to hospitalize patients with this type of lesion immediately.

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THE TUBERCULIN TEST*

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NEARLY everyone has at some time in the past spaded and raked a flower bed in the spring. Minute seeds were then scattered over and raked into the soil. The seeding is followed by a period of time during which it is impossible for a neighbor or anyone but the planter himself to state what kind of seed had been sown in the soil. The seeds must germinate, and even when the seedlings make their first appearance through the surface of the soil, it is impossible for those not knowing the kind of seed planted to determine the species of plant. Only after the sprout has become sufficiently large so as to present definite characteristics, can the species actually be determined.

One may liken the planting of such flower seeds in the earth to the planting of germs of disease in the human body. With many of the germs it is impossible to determine their location or their kind until they have produced changes in the tissues which characterize them. This may require days, weeks, months, and even years with some of the pathogenic micro-organisms. A few of these organisms, very soon after entering the body and before they have produced areas of disease sufficiently large to be detected, bring about changes which make it possible for us to detect their presence by biological tests. One of the best examples is the tubercle bacillus. Within a short time after the tubercle bacillus has entered the body (and found lodgment), it brings about a change which we speak of as allergy and which is very readily detected by the tuberculin test.

Tuberculin was first prepared by Koch and was used by him as a test for tuberculosis in man and animals and as a therapeutic agent. Koch did not understand tuberculin as well as we do today; so some disastrous results followed its administration as a therapeutic agent. The pendulum then swung far toward the side of disfavor. Pirquet and Mantoux in 1907 and 1908 presented methods of applying the test which were harmless. When the test was applied in Vienna and other great centers of civilization, it was found that most persons who had reached the age of fifteen years reacted positively. Therefore, except in infancy and early childhood, the test was again in disrepute.

In many parts of the world the tuberculosis picture has changed almost completely since the days of Pirquet and Mantoux. The opportunities for exposure to tubercle bacilli have been reduced so that the incidence of infection is far lower than previously. Therefore, the value of the tuberculin test has increased and is increasing every year. That the tuberculin test is one of the most accurate tests ever discovered by man may truthfully be said.

The following quotation from Dorset informs us as to the nature of tuberculin: "Tuberculin is the clear, sterile filtrate obtained from culture of tubercle bacilli on a broth medium. The broth medium is essentially nothing but meat extract to which salt and glycerine are added. The cultures of tubercle bacilli on this broth are completely sterilized by heat, and the killed bacilli are removed by filtration. The tuberculin, therefore, contains only the unused portions of the culture liquid plus any soluble substances which may have been formed in the broth as a result of the growth of the bacilli.

"Since tuberculosis is a most serious and fatal disease, it would not be unreasonable to expect that some men would claim that the tubercle bacillus, growing on broth in laboratories, would excrete into the broth poisons or toxins which would be capable of producing in healthy individuals symptoms and lesions similar to those of the disease itself. It is a well known fact, however, that all bacteria under such conditions do not produce soluble toxins or poisons. The broth on which tubercle bacilli have been grown (tuberculin) may be injected into normal animals in doses vastly greater than those used for testing purposes, without causing any ill effect whatever. With tuberculous animals, on the other hand, the case is quite different for they are extremely sensitive to the culture filtrates from tubercle bacilli (tuberculin). This curious fact has a close analogy in the peculiar sensitiveness that certain individuals exhibit to the pollen of plants. For most people this pollen is without effect, and yet it causes most distressing symptoms in hay-fever patients because they in some way have been sensitized to the pollen. The case is the same with tuberculosis and tuberculin. Infection, often to a very slight degree, is sufficient to sensitize animals to tuberculin."

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*From the Departments of Preventive Medicine and Internal Medicine, University of Minnesota, and the Lymanhurst School for Tuberculous Children. Presented before the 78th Annual Session of the Minnesota State Medical Association at Minneapolis, May 6, 1931.

The type of tuberculin to be used for this test has been a subject of considerable discussion. At one time it was believed that a person or animal infected with the bovine type of tubercle bacillus would react positively to tuberculin made from that type of tubercle bacillus only. Experimental studies have proved that such a specificity ordinarily does not obtain. Animals infected with the avian or bovine type of tubercle bacilli will react positively to tuberculin made from the human type of tubercle bacilli. In fact, the veterinarians, who have tested many million cattle. use Koch's Old Tuberculin made from the human type of bacilli.

A great many methods of administering tuberculin have been employed. The majority of workers in the field of tuberculosis are now convinced that the intracutaneous method of Mantoux is superior to all methods known. The dilutions used for this test are simple and may be made by the physician himself or by the pharmacist. The dilution for the first test consists of one part of Koch's Old Tuberculin to nine thousand nine hundred ninety-nine parts of physiologic salt solution. One-tenth of a cubic centimeter of this solution is introduced into the layers of the skin just as one would administer the material for a Schick test. This amount of the dilution contains one-hundredth of a milligram of tuberculin. If the test is negative at the end of forty-eight or seventy-two hours, a second test is usually applied. The dilution for this test consists of one part of Koch's Old Tuberculin to ninety-nine parts of physiologic salt salt solution. One-tenth of a cubic centimeter of this solution is administered in precisely the same manner as the first test, but it contains a full milligram of tuberculin. If this test is negative, we usually feel that tuberculous infection is not present. However, some physicians prefer to continue using stronger concentrations until five or ten milligrams of tuberculin are given for one test.

The diagnostic specificity of tuberculin is evidenced by the positive reaction of animals which have first been proved negative and then were inoculated with tubercle bacilli. Good evidence is also obtained by applying tuberculin tests to members of families in homes where open cases of tuberculosis exist; then applying the test to the same number of members of families in homes where tuberculosis does not exist. Work of this kind has been done in Minnesota by such excellent physicians as Lampson and Slater. Perhaps the best evidence has been contributed by the veterinarians who, after the animals react positively to tuberculin, examine their bodies at postmortem. The high incidence of disease found in the bodies of these animals has proved beyond doubt the specificity of tuberculin.

A positive tuberculin test in the body of a human being nearly always means that somewhere in the body tubercle bacilli have found lodgment. They have multiplied and tubercles have been or are being produced. In other words, there is an area of tuberculous disease somewhere in the body. It may be no greater in size than that of a millet seed, or it may be of sufficient extent to overwhelm and take the life of its host. This area of disease, which is necessary to cause the body to react positively to tuberculin, may be completely under control or it may be progressing. It may have been present many years or it may be of rather recent origin; it may be in the lung or it may be in some part of the body very remote from the lung. The tuberculin test only informs us that the area of disease is present. The tuberculin test is not a test for immunity—it is only a test for allergy.

The tuberculin test is not infallible. Like every other biological test known to man, it occasionally fails. During the time between the entrance of the tubercle bacilli into the body and the development of allergy, which is known as the pre-allergic stage, the tuberculin test is negative. This usually is a period of from two to three weeks. However, the time varies.

In terminal cases of tuberculosis, allergy apparently decreases. The ordinary dose of tuberculin may cause no reaction, but if the dose is increased to a sufficient extent, even in such cases a positive reaction is obtained. Some believe that tuberculous lesions, particularly those of the childhood type, may, after years, become completely burned out, or perhaps walled off to such an extent that there is no communication between the products of the tubercle bacili and the adjacent tissues. Individuals possessing such lesions may lose their allergy and hence react negatively to the tuberculin test. The available evidence of such complete control of tuberculous lesions is slight.

Perhaps the convincing evidence of the value of the tuberculin test has been demonstrated by those interested in the live stock industry. The veterinarians saw early the significance of the tuberculin test. In fact, Gutman used tuberculin to test cattle in Dorpat, Russia, as early as 1891. Although tuberculin was used in this country to test cattle in 1893, the intensive and extensive campaign did not begin until about 1917. In the interval between 1893 and 1917, work preparatory for this campaign was done.

The results accomplished by the veterinarians are astounding. In 1930 alone, 12,506,198 cattle were tested with tuberculin in the United States. Almost 1.7 per cent reacted positively. In 1918, 4.9 per cent of the cattle tested reacted positively. This represents a large reduction in the number of reactors. In the State of Minnesota, fifty-five of our eighty-seven counties have reduced the number of reactors to tuberculin from approximately 7 per cent to 0.28 per cent. In the State of Wisconsin, there are certain counties where tuberculosis has been completely eradicated from cattle. For six years it has been impossible to find a single positive reactor.

From an economic standpoint the saving to this country from the work of the veterinarians has been so great that most of us cannot even conceive of the figures. Dr. H. R. Smith, Commissioner of the National Live Stock Exchange, makes the following statements:

> "If the percentage of cattle condemned for tuberculosis in the United States had been as high during 1930 as during 1916, when the campaign was started, there would have been 21,387 more cattle carcasses condemned than were actually condemned during 1930. On the basis of twenty cattle to the car and thirty cars to the train, this represents thirty-five trainloads of cattle saved from the rendering tanks in 1930 as compared with 1916.
>
> "If the percentage of hogs condemned for tuberculosis during 1930 had been as high as during 1916, there would have been 43,059 more hog carcasses condemned during 1930 than were actually condemned. On the basis of sixty-five hogs to the car and thirty carloads to the train, this represents twenty-two trainloads of hogs saved from the rendering tanks, or a total of fifty-seven trainloads of cattle and hogs saved for food.
>
> "If those cars were to be placed in one solid train, allowing forty feet, outside measurement of each car, it would represent a train thirteen and one-tenth miles long saved from the grease tanks during 1930 as compared with 1916.
>
> "A train of cattle and hogs six and eight-tenths miles long was saved from sterilization during 1930 as compared with 1916, on which sterilized carcasses the loss is approximately one-half.
>
> "Comparing 1930 with the year previous, 1929, the saving from condemnation was eight trainloads of cattle and two trainloads of hogs, or a solid train two and three-tenths miles long. Another train of cattle and hogs nearly one mile long was saved from sterilization, which product is sold as canned meat and labelled 'Sterilized.'"

The campaign has gained such momentum and proved its great value so that in 1930 the Federal appropriation was $6,361,040, while State appropriations total $12,154,226. Already two million cattle which reacted positively, together with the bacilli they contain, have been destroyed. Here is the greatest demonstration of tuberculosis control of all time. For some time we feared and fought tuberculosis in animals on the ground that it was dangerous to the human family. The scene has changed. The veterinarian is now fearing exposure of animals to tuberculous members of the human family.

In the human family we must proceed to a certain point exactly as the veterinarian does. In other words, we must adopt the area testing plan, keeping in mind that tuberculin is highly specific and that the test is harmless when properly administered. Already area testing has been practiced in a very limited way, but the procedure is gaining in favor. In Minnesota, such men as Slater and Lampson blazed the trail. The work of these physicians has been quoted in medical literature around the world. As early as 1925, Slater tested children in a rural community and found that only 10 per cent reacted positively to the tuberculin test. In the last two years, the Minnesota Public Health Association and the State Board of Control have done a great deal to stimulate interest in area tuberculin testing of human beings. The most encouraging result has been the finding of the incidence of tuberculous infection very low among high school girls and boys and even among those of college and university age. Today, the zeal of an idealist or an enthusiast is not necessary for the recommendation of area testing of human beings because the procedure has become a standard one. Chadwick of Massachusetts and later of Detroit. McCain of North Carolina, Rathbun of New York, and many others had proved the great value of this procedure before the Minnesota Public Health Association and the Minnesota State Board of Control adopted it.

The mere application of tuberculin tests is of no avail as a tuberculosis control measure. It only informs us of the incidence of tuberculous infection. The veterinarians slaughter all reactors. At this point, we cannot continue to follow the lead of the veterinarian. Our problem now becomes much more complicated than his, but we are in a position to institute a program which he could never carry out, namely, the program of education. From this point then it becomes a matter of educating the public so that the procedures recommended will be accepted. Without this education we are unable to carry on. With this education, we can proceed from the positive reactions to the source of their infection.

Tuberculosis is a communicable disease; therefore, every person who reacts positively to the tuberculin test has been exposed to tubercle bacilli. To find the source and stop it is the best known treatment for the person who already reacts positively to tuberculin. The fact that continued exposure even among adults rather frequently leads to disaster is well established. We have in mind not only the protection of the positive reactor but the protection of every person who subsequently comes in contact with that positive reactor. We also have in mind the welfare of the person who is the source Frequently such persons are found not to be ill. A small percentage of them never are ill with tuberculosis yet they are spreading bacilli so that we speak of them as carriers. Another group who are not ill now but who have tubercle bacilli in the sputum will sooner or later become ill. If their disease is detected, this illness may be prevented. Thus, it is the good of the community that takes first place in this program.

By such area testing and follow-up work, we can very quickly construct maps of townships, counties, states, and the Nation just as veterinarians have done. These maps should tell us where the foci of tuberculosis are. When this is done, we will find areas that are veritable nests of tuberculosis and other areas where very little tuberculosis exists. With this knowledge at hand we know where to concentrate our efforts. In other words, we are no longer working blindly.

But what shall be done about the child who is found to react positively to the tuberculin test? When a child is found to react positively to the tuberculin test and no evidence of tuberculous disease can be demonstrated, the question that often arises is, what explanation should be given the parents. One person says that if we tell the parents that tubercle bacilli are in the child's body, we create tuberculophobia. A physician cited the following example: "Tuberculin tests had been applied to the school children in a rural community. The parents of one child, who reacted positively, complained that when this fact was noised about among the other children, those of the same neighborhood who had been accustomed to walking to school with this child, promptly refused to even walk with him." Another physician stated that when a child in a certain community had been transferred from regular school to a special school for tuberculous children, the children of the neighborhood refused to play with him before and after school hours.

I believe that our answer to the original question, "What shall we tell the parents?" should be "Tell them the truth." Tell them that through exposure the children have taken into their bodies of the germs of tuberculosis and that we cannot determine from the tuberculin test whether these germs have been brought under control. Even if we could state that at the time the germs are under control, we cannot go further and say that they will always remain under control. We can state with safety that every child who has had a tuberculous infection, as manifested by a positive tuberculin reaction, is a potential case of clinical tuberculosis, whether it be the lungs, the bones and joints, or other parts of the body. If they are not casting tubercle bacilli from their bodies, they are not a menace to other children at the time. The consoling fact may be told them that only a very small percentage of those who react positively to the tuberculin test develop a clinical form of disease. But the unfortunate fact which we must also inform them of is that we have no way to determine which child will develop clinical disease at any time. Therefore, the only honest way out is to advise measures, such as protection from further exposure, the building and maintaining of what we call high resistance against disease, and keeping such cases under medical and nursing supervision.

The measure of primary importance is the attempt to discover and to arrest the source of infection whether it be in the home or elsewhere. This may be done by isolating the diseased members of the family or by teaching them how to prevent the spread of tubercle bacilli to others. The child's best chance for recovery is promoted when further exposure to tubercle bacilli is stopped. If exposure be allowed to continue, the infected child is in great danger. The children who react positively to tuberculin, but who have no demonstrable manifestation of disease, should be kept under observation, perhaps not strict observation, but they should be supervised and examined at least two or three times in every year. Each child who reacts positively to tuberculin and who has demonstrable disease should be kept under very close observation. If the disease is of the childhood type, the treatment required will depend upon its stage at the date of discovery. It may be very recent disease in the inflammatory stage. If so, strict bed rest may be indicated for a while, although the majority of them recover without it. On the other hand, the disease may have become latent so that lime deposits in the lungs and lymph nodes are easily demonstrated by the X-ray. The presence of lime does not by any means indicate that the disease is healed. The following statement by Dr. H. E. Robertson, Professor of Pathology, Mayo Foundation, is significant: "I am very greatly impressed with the microscopic study of these apparently healed lesions. Very many of them show evidence of some activity histologically and I am steadily being strengthened in the opinion that the tuberculous lesion in most instances constitutes a menace of renewed activity as long as the individual may live." He is inclined to believe that the above statement applies particularly to the first infection or childhood type of tuberculosis, including the involvement of the lymph nodes at the root of the lungs. Dr. Robertson also states that he frequently finds calcium deposits, caseous material, and activity histologically all in one lesion.

Therefore, these children need special attention. They should have more rest than the normal child. In addition to long hours in bed at night, they should have one or two rest hours during the day. They must receive the proper kind of food in sufficient quantities. There is danger in overlooking the fact that the child's body is growing and that he is extremely active in play; therefore, much food is required. This food must contain the vitamins, animal proteins and other properties so necessary for energy, production, growth, and repair of the body. These children have a better chance in special schools for tuberculous children than in the regular schools. In such schools they are with others of their kind who are receiving the same treatment and they do not object to the special routine. These children are potential spreaders of tubercle bacilli, inasmuch as the caseous or cheesy material in the lymph nodes may possibly find its way into the bronchial tubes, thus contaminating them with tubercle bacilli which may be spread to the bodies of others through coughing, sneezing, and expectorating. In a special school for tuberculous children, a careful watch may be kept for such developments and for the minimal stage of the adult type of disease since every child with latent childhood tuberculosis is a potential case of adult tuberculosis. For children with progressive tuberculous disease, whether it be of the childhood or the adult type, strict bed rest should be employed. If the home conditions are not favorable, most certainly institutional care should be sought.

EXTRAOCULAR PALSIES*

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Anthony Feiling[1] says, "Ocular palsies constitute a symptom of the greatest interest and importance. They are of interest because they offer a very wide field for diagnostic skill, as well as an opportunity for a study of many different diseases. They are of importance because they are not infrequently one of those early signs of disease of the nervous system which call for exact diagnosis and appropriate treatment." A detailed discussion of all the phases of extraocular palsies would be superfluous and too complex and time-consuming for a paper of this nature. It is my intention, therefore, to point out only some of the more elementary anatomical, physiological, and clinical considerations pertinent to the subject.

ANATOMY AND PHYSIOLOGY

There are seven extraocular muscles subserving movements of the eyeball. They are the levator palpebræ superioris, superior, internal, and inferior recti, and the inferior oblique, all supplied by the oculomotor or third cranial nerve; the superior oblique supplied by the trochlear or fourth cranial nerve; and the external rectus supplied by the abducens or sixth cranial nerve. The levator palpebræ superioris is the only one of the extraocular muscles that acts alone, the others always acting in pairs or groups. Therefore, all extraocular movements are associated movements and their performance depends upon the existence of central connections between the nuclei of the various cranial nerves subserving them.

The nuclei of the oculomotor nerves lie in the gray matter surrounding the floor of the aqueduct of Sylvius. The nuclei of the third and fourth nerves are almost contiguous and lie forward toward the floor of the third ventricle. The nucleus of the sixth nerve lies farther caudally, near the floor of the fourth ventricle, and is separated from the third and fourth nuclei by a definite interval. All of the nuclei are connected by a very important structure known as the dorsal or posterior longitudinal fasciculus. This bundle of fibers is responsible for the harmonious synergetic action of the extraocular muscles supplied by the various oculomotor nerves. One of its chief functions is to bring the action of the external rectus muscle of one eye (sixth cranial nerve) into relationship with the action of the internal rectus of the opposite eye (third cranial nerve). This relationship is responsible for lateral conjugate deviation of the eyes, which is one of the most important of all extraocular movements. (Fig. 1). The exact anatomical basis for upward conjugate deviation has not yet been determined definitely, but the center for this movement is thought to be in the region of the anterior corpora quadrigemina. At least, lesions in this vicinity frequently are accompanied by paralysis of upward conjugate deviation.

The centers for extraocular movements are under the control of very important supranuclear centers in the cerebral cortex, situated most probably in the second frontal convolution of the opposite side. Paralysis of this center causes deviation of both eyes toward the side of the lesion, while stimulation causes deviation toward the opposite side. Also, paralyses due to a lesion in this area are usually more or less permanent, while the reflex movements of the eyes are not affected.

CLINICAL CONSIDERATIONS

Because of the complicated anatomical arrangement of the structures concerned in extraocular movements, paralyses may result from a great variety of lesions situated in any one of a number of places. For this reason it is necessary that we have some kind of a working scheme the better to enable us to understand the pathological processes concerned when we encounter an extraocular palsy.

There are two possible ways in which to classify extraocular palsies. They may be grouped according to the anatomical location of the lesions causing them, or they may be considered according to the nature of the lesion concerned (etiologically). For the anatomical classification I will use the outline suggested by Leslie Paton.[2] According to this writer ocular palsies may be divided into three main groups with sub-groups as follows:

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*Read before the meeting of the Ramsey County Medical Society, May 25, 1931.

I Paralysis of cerebral origin
  A. Supranuclear lesions
    1. Cortical
    2. Sub-cortical
  B. Internuclear lesions
  C. Nuclear and nerve root lesions
II Paralysis of extracerebral origin, *i.e.*, of nerve trunks
  A. Intracranial
  B. Intraorbital
III Paralysis of muscular origin

As with disturbances of function any place in the nervous system, the causative agent in oculomotor palsies may be inflammatory, vascular, neoplastic, degenerative, traumatic, or the disturbance may be due to a congenital anomaly in the structures involved.

PARALYSES OF CEREBRAL ORIGIN

Case 1.—C. V. D., a black male, aged 54, was admitted to the Neurological Service at Ancker Hospital July 10, 1930, in a comatose condition. History obtained from the relatives indicated that he had been suffering from hypertension and nephritis for a number of years. Four months previous to his admission he had had a retinal hemorrhage in the right eye. A few hours before admission, while mowing his lawn, he had suddenly fallen to the ground unconscious, breathing heavily, and frothing at the mouth. A few minutes later he vomited. He was taken into the house and seen by a physician, who sent him into the hospital, where I saw him shortly afterward. The neurological examination showed a flaccid paralysis of all four extremities with absent tendon and superficial reflexes. No pathological reflexes could be elicited. Breathing was stertorous and the left side of the face puffed out upon each expiration. Pupils were equal and regular but did not respond to light. (He had received morphine before being taken to the hospital.) Both eyes were turned toward the right. Occasionally they would move spontaneously toward the midline, and the movements of both eyes were synchronous. However, they always would come to rest in the position of right lateral conjugate deviaiton. The clinical diagnosis was massive cerebral hemorrhage in the right hemisphere involving the posterior part of the second frontal convolution, either cortically or subcortically. The patient died without regaining consciousness, and autopsy confirmed the clinical diagnosis.

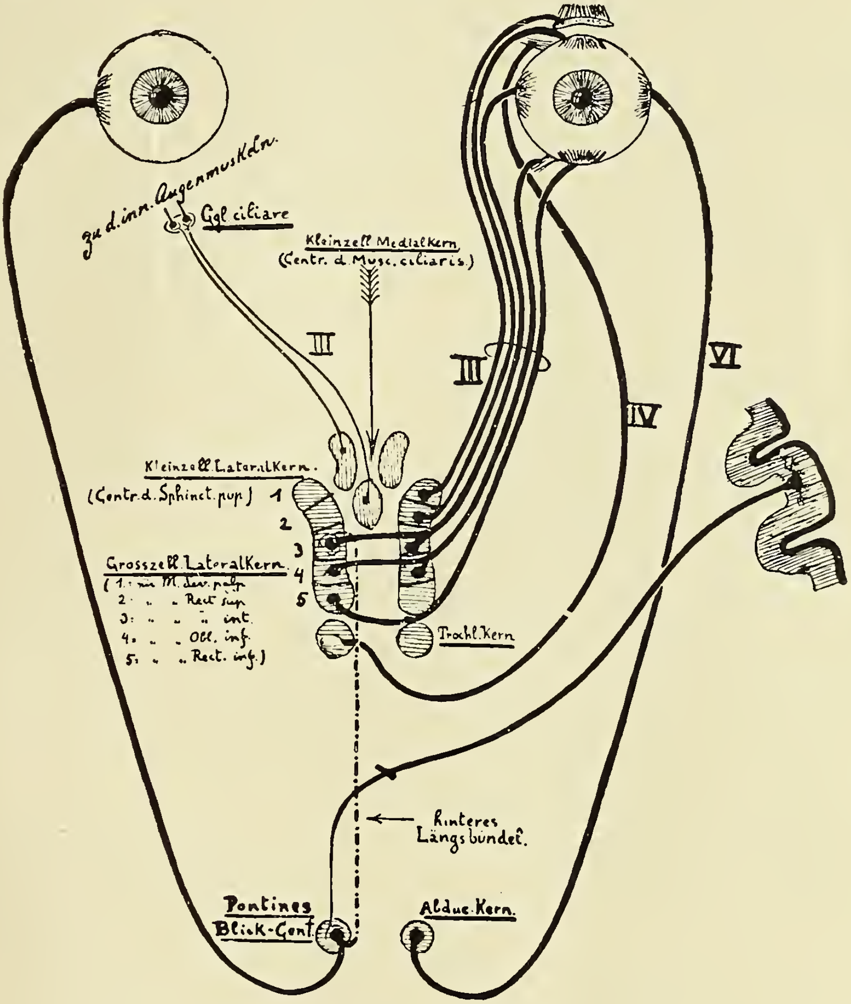
In the anatomical discussion it was stated that the third-sixth nerve complex with its connecting posterior longitudinal fasciculus is under the control of a center in the cortex of the opposite side and that paralysis of this center caused the eye to turn toward that side. "The patient looks toward the side of his lesion." In the above case there was a paralytic lesion, as evidenced by the flaccid paralysis of all four extremities. The fact that there was lateral conjugate deviation of the eyes to the right indicated to us that the lesion was in the right hemisphere. This is an example of an oculomotor palsy resulting from a supranuclear lesion.

Case 2.—L. E., a single male, aged 37, was admitted to the Neurological Service of Ancker Hospital in August, 1930, suffering from blurred vision, pain in the chest, difficulty in walking, and mental confusion. There was a history of excessive alcoholic indulgence extending over a period of several months. The physical examination was grossly negative and all noteworthy findings were confined to the nervous system. The left pupil was slightly larger than the right, and both reacted sluggishly to light and in accommodation. There was moderate congestion of both optic discs. Concerning the extraocular movements, convergence and movements upward and downward were full, steady, and synchronous. However, there was paralysis of conjugate deviation to both right and left. In other words, the eyes seemed to be fixed in the midline as far as lateral conjugate movements were concerned, but that there was no paralysis of the internal recti was shown by the fact that convergence was normal. Moreover, the fact that there was no strabismus indicated the absence of a sixth nerve palsy. What really existed was a paralysis of *movement* rather than of any individual nerves. Both knee and ankle jerks were absent, there was bilateral ataxia, and slight atrophy of the calf muscles. Blood Wassermann and spinal fluid were negative.

The patient developed symptoms of a Korsakow psychosis and was committed to the state hospital for the insane. On October 31 it was reported that all his extraocular movements had returned to normal except for a fine vertical and horizontal nystagmus.

While the diagnosis in this case could not be confirmed by autopsy, the probabilities are that this patient had an alcoholic toxic-degenerative process in his mid-brain interfering with the conductivity of the posterior longitudinal fasciculus. I present it as an illustration of an ocular palsy due to an internuclear lesion.

Nuclear lesions may be divided into two groups, acute and chronic. Among the acute types are found those accompanying the various toxemias such as botulism, encephalitis, influenza, and alcoholism. Frequently one sees a nuclear ophthalmoplegia clinically, and upon postmortem examination of the oculomotor nuclei is unable to find any anatomical explanation for the paralysis. I recall a patient examined by Dr. Hammes and me a few years ago who had progressive paralysis of all of her motor cranial nerves beginning with the oculomotor group and finally involving those in the medulla oblongata. The progression, extent, and character of the paralysis indicated a nuclear involvement, yet post-mortem examination of serial sections of the brain stem failed to disclose any pathology in either the cranial nerve nuclei or in the nerve roots. In the chronic nuclear palsies one must always think of syphilis, although there are some other more rare types of involvement, such as the congenital ophthalmoplegias of nuclear origin, and the alternating nuclear ophthalmoplegias.


zu d. inn. Augenmuskeln.
Ggl. ciliare
Kleinzell. Medialkern
(Centr. d. Musc. ciliaris.)
III
III
IV
VI
Kleinzell. Lateralkern.
(Centr. d. Sphinct. pup.)
1
2
3
4
5
Grosszell. Lateralkern.
(1.: für M. Lev. palp.
2. .. .. Rect. sup.
3. .. .. .. int.
4. .. .. Obl. inf.
5. .. .. Rect. inf.)
Trochl. Kern
hinteres Längsbündel.
Pontines Blick-Cent.
Abduc.-Kern.

INNERVATION OF THE OCULAR MUSCLES.

III = Oculo-motor nerve.
IV = Trochlear nerve.
VI = Abducens nerve.

Fig. 1. Diagram illustrating the central connection between the third and sixth cranial nerve nuclei. The broken line (labeled "hinteres Längsbündel") represents the posterior longitudinal fasciculus. From Bing's "Gehirn und Auge."

PARALYSIS OF EXTRA-CEREBRAL ORIGIN

Under this group of oculomotor palsies we include those due to involvement of the nerve trunks themselves, and divide them into two groups, intracranial and intraorbital.

A good example of intracranial, extracerebral type of involvement is that seen in Gradenigo's syndrome. The occurrence of this syndrome depends upon the fact that the sixth or abducens nerve passes over the tip of the petrous portion of the temporal bone within the cranial cavity. Accordingly, in mastoiditis when the infection has extended inward to produce a caries of the petrous portion, there sometimes is involvement of the sixth nerve with a consequent turning in of the eye on that side. This condition usually is accompanied by severe pain in the side of the face and up over the scalp on the affected side. This pain is thought to be due to a simultaneous involvement of the fifth or trigeminal nerve.

Basal skull fracture is a frequent cause of extracerebral, intracranial ocular palsies.

Case 3.—B. D. F., a white male, aged 38, was admitted to the Neurological Service of the Ancker Hospital in July, 1929, suffering from acute alcoholism, severe contusions and lacerations of the scalp, bleeding from the nose and ears, and a divergent squint. His past history was irrelevant, and he never had had any trouble with his eyes. He stated that he had been on a drinking party during which a fight started. He thought that somebody struck him over the head but could not remember anything until he regained consciousness in the hospital. When I saw him he still had some oozing of blood and cerebrospinal fluid from his right ear, and there was a complete paralysis of all the muscles supplied by the right oculomotor nerve. The pupil was dilated and did not respond either to light or in accommodation. The eyeball was turned outward and could not be brought toward the midline either in convergence or in conjugate movement with the other eye. There also was paralysis of the right superior and inferior recti. The neurological examination was otherwise negative. A diagnosis was made of basal skull fracture with either tearing of the right oculomotor nerve at its exit from the brain in the interpeduncular space, or involvement of the nerve by a basal hemorrhage. Unfortunately, the patient left the hospital against medical advice before sufficient time had elapsed to determine the nature of the oculomotor involvement. However, the absence of any other neurological signs indicated that the nerve was injured outside the brain substance.

Intraorbital oculomotor palsies may be single or multiple and can result from any pathological process within the orbit or at the entrance at its posterior pole of the oculomotor nerves.

Case 4 was that of a young adult woman seen in the Clinic of Dr. James Collier at Queen's Square Hospital, London. She stated that about two weeks previous to her admission to the hospital she began to have severe paroxysmal pains in the region of her right orbit. A short time later it seemed as if her right eye were bulging and it was tender on pressure. There also was pain in the right side of her forehead. Three days before her admission she began to have diplopia when looking to the right, and later on attempts to look in any direction were accompanied by diplopia. The neurological examination was negative except for a complete right ophthalmoplegia externa associated with an impairment of touch and pain sense over the right side of the forehead. The blood Wassermann was negative, and the spinal fluid was normal. A diagnosis was made of an inflammatory lesion in the region of the right sphenoidal fissure impinging upon the third, fourth, and sixth nerves, and the ophthalmic division of the right fifth nerve. The optic nerve was spared because it enters the orbit through another opening, the optic foramen. The patient was given mercury and sodium salicylate by mouth and after about ten days in the hospital she began to improve. After three weeks in the hospital she was discharged practically cured except for a very slight weakness of her right sixth nerve and a questionable hypalgesia of the right side of her forehead.

PARALYSIS OF MUSCULAR ORIGIN

One of the most frequent causes of oculomotor palsies of muscular origin is myasthenia gravis. James Taylor[3] says that about 80 per cent of the cases of myasthenia gravis that he has seen were at the Royal London Ophthalmic Hospital. Ptosis and diplopia belong to the so-called "permanent" symptoms of myasthenia gravis and may precede the weakness of the other muscles of the body by months and sometimes even years.

Case 5.—Mrs. B. S. F., white, aged 48, was referred to Dr. E. M. Hammes by Dr. George Walker of St. Paul on December 4, 1925. Her family and past histories were negative and she stated that in the spring of 1925 she began to have difficulty in swallowing and talking. Along with this there also was some weakness of the jaw muscles which came on if the patient chewed for any length of time. The weakness of the muscles of chewing and swallowing would proceed to utter exhaustion, from which they would recover after a period of rest. After thoroughly chewing her food the patient would find it difficult to swallow as "it would pile up against her soft palate." Also toward afternoon and evening the patient's voice would become muffled and she would find it difficult to make people understand what she was saying. All of her symptoms of muscular weakness would disappear when she was thoroughly rested.

Concerning her oculomotor mechanism, the patient noticed that when she became fatigued her right eyelid would droop almost to closing. Also, after reading for any length of time she would see double (fatigue of the internal recti). These symptoms would disappear after rest only to return when the patient resumed her activities. The neurological examination was entirely negative for organic signs except for some ptosis of the right eyelid. A myasthenic reaction was obtained in the muscles of the forearms. The blood Wassermann was negative and the cerebrospinal fluid was normal. The clinical diagnosis was myasthenia gravis. In this case the ocular palsies were transient and appeared after other myasthenic symptoms had been present for several months.

Another condition in which one sometimes finds oculomotor palsies of muscular origin is Graves' disease. Garvey quotes Halloway, Fry, and Wentworth, who studied the ocular signs in 100 unselected cases of goiter and found two cases of paresis of the superior oblique muscles. He also reports a case of his own in which a complete ophthalmoplegia externa preceded by some months other clinical signs and symptoms of a typical Graves' disease. Ten months after a subtotal thyroidectomy there was some improvement in the ocular signs.

The outline and case reports just presented are intended to give a simple working basis for a clinical study of extraocular palsies. Obviously all of the various types of paralysis cannot be included, and in many instances there can be no sharply defined limits between lesions affecting nuclei, nerve roots, or association fibers. Syphilis, for instance, is capable of producing an oculomotor paralysis in numberless different ways. It may affect any part of the oculomotor apparatus, and, according to Paton, is responsible for about 40 per cent of all cases of ophthalmoplegia. Other conditions, such as disseminated sclerosis, alcoholism, encephalitis, and others, may affect the oculomotor mechanisms in a variety of ways and frequently it is extremely difficult to determine clinically whether we are dealing with a pure nuclear, intranuclear, or a nerve root lesion, or whether it is a diffuse process involving several structures. Sometimes a study and proper evaluation of the concomitant signs and symptoms is of great value in differential diagnosis.

As an aid in enumerating the various clinical conditions in which we encounter ophthalmoplegias, I refer to Paton's[2] classification of ocular palsies from an etiological standpoint.

I. Acute and sub-acute ophthalmoplegias
  A. Poisons—alcohol, lead, botulism, carbon monoxide, sulphuric acid, etc.
  B. Infective agents—encephalitis, diphtheria, influenza, syphilis, etc.
  C. Trauma
  D. No etiological factor—according to Uthoff 33 per cent
II. Chronic (progressive) ophthalmoplegias
  A. An isolated lesion—monosymptomatic ophthalmoplegia externa
  B. Tabes and general paresis—about 20 per cent of all ocular palsies (Uthoff)
  C. Disseminated sclerosis—usually nerve root
  D. Bulbar palsies, progressive muscular atrophy
  E. Diabetes—most likely a neuritis
  F. Graves' disease
III. Congenital ophthalmoplegias of nuclear origin
IV. Unilateral ophthalmoplegia
V. Recurrent or alternating ophthalmoplegia of nuclear origin

The above classification is not wholly satisfactory when used simply alone. For a proper evaluation and interpretation of ocular palsies it is necessary to consider them from both the anatomical and the etiological standpoints. Accordingly, Paton's classification is extremely useful.

In this discussion no attempt has been made to delve into or expound the anatomical and physiological minutiæ of the oculomotor mechanisms. Inasmuch as there still are many controversial aspects to the subject, such an attempt would be too time-consuming and not pertinent to my purpose, which has been merely to present the clinical applications of some of the more clearly established and elementary principles involved.

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RECENT ADVANCES IN THE STUDY OF THE CAUSE AND TREATMENT OF LEUKORRHEA*

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LEUKORRHEA is usually due to lesions of the cervix or vagina, rarely to disease in the upper part of the genital tract. A certain few conditions in the body of the uterus, such as adenocarcinoma, submucous fibroids, and polyps may lead to an appreciable white discharge, but endometritis and salpingitis are now given slight consideration as basic pathological conditions in this connection. The former occurs only rarely, and the diseased tube probably does not discharge its inflammatory products into the lower tract. Excluding malignant conditions, endocervicitis is the most common cause of leukorrhea, while vaginal infections with the Trichomonas vaginalis and with the Monilia group of fungi represent the latest additions to recognized etiological factors.

ENDOCERVICITIS

Endocervicitis is commonly preceded by gonorrhea or by an obstetrical episode. Laceration of the cervix incident to childbearing may open the way to infection with various microörganisms of low virulence. The appearance of cervicitis in virginal women suggests that occasionally a blood-borne infection may involve the cervix. The only symptom of the condition is leukorrhea, which tends to be aggravated by the pelvic hyperemia incident to menstruation and to pregnancy, and secondarily by debilitating diseases. The cervix appears enlarged and frequently presents dilated gland structures (Nabothian follicles) on its vaginal surface. Usually there are bright red areas of erosion or eversion, extending out from the os on the anterior or posterior cervical lip, and representing patches of cervical mucosa, which has become exposed by cervical tears (eversion) or has proliferated to replace the vaginal mucous membrane (erosion). Not infrequently these areas produce contact bleeding and arouse a suspicion of malignant change, which can be eliminated only by biopsy.

The cervical glands are compound racemose in character and penetrate deeply into the body of the cervix, beyond the reach of local antiseptic applications. At most, only temporary relief can be expected from such treatment, or from douches which merely wash away the secretion already discharged from the infected glands. Consequently, these modes of treatment have been largely discarded and newer methods are advocated. The fine-wire, nasal, electric cautery is very effective in that it destroys the infected glands and thus removes the source of the discharge. With the cautery wire heated cherry-red, lineal cauterizations are made in the canal and over the exposed eroded or everted areas. After several weeks the treatment may be repeated if inspection shows that the lesion has not been completely cured. The one apparent contra-indication is acute or subacute pelvic inflammatory disease, which may become acutely exacerbated following cauterization. The surgical treatment of cervical leukorrhea is occasionally indicated: simple trachelorrhaphy for patients with old lacerations and eversion, and the Sturmdorf operation for certain persistent cases with involvement of the entire cervical mucosa. The use of the cautery for the control of an increased leukorrhea during pregnancy is debatable; it may be done gently but probably carries some risk to the continuance of gestation.

Until recently, vaginal infection, except with the gonococcus, has been largely ignored in considerations of the etiology of leukorrhea, but we are now convinced that such local conditions are frequently concerned with the production of an abnormal vaginal discharge. Many women have been accused of having gonorrhea because of a persistent vaginitis and leukorrhea, when in reality they suffered from non-venereal parasitic infections. And other unfortunates have been submitted to hysterectomy and salpingectomy without relief, when the disease was local in the vagina. Two distinct organisms—the Trichomonas and the Monilia—have been isolated from such patients, and very probably others still remain to be identified.

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*From the Department of Obstetrics and Gynecology, State University of Iowa. Read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

TRICHOMONAS VAGINALIS VAGINITIS

Trichomonas vaginalis vaginitis is apparently promoted by lack of cleanliness, since clinic patients are more commonly affected than private patients, and colored women than white; but other factors must enter the picture, since very fastidious women may show the condition. The discharge is typically highly acid in reaction, of a muco-purulent consistency, creamy yellow in color, and appears foamy or frothy. Vaginal and vulval burning, itching, and smarting are common complaints, and may be more annoying than the profuse discharge. The symptoms tend to become worse during or after the menses, possibly because the reduced acidity in the vagina at this period favors the growth of the parasites. The vaginal mucosa is intensely reddened and may appear granular. Minute ulcerations are occasionally present. Digital or speculum examination may be very painful.

Diagnosis is made by examining the fresh discharge under the microscope in a hanging drop preparation or on an ordinary glass slide, the cover slip being kept from the slide by interposing two or three cotton threads. The oval parasite is recognized by its motility, which is produced by the rapid vibration of several (probably four) flagella attached to one pole. The organisms are larger than leukocytes but smaller than the vaginal epithelial cells. They do not stain easily and cannot be found in smears stained by the usual methods. Culture is possible but rather difficult, and therefore not useful as a diagnostic measure. Identification of the organisms in the vaginal discharge does not prove their causal relationship to the symptoms, since they may be harmless invaders, as certain writers have postulated, but if other etiological factors cannot be involved, the assumption is that the trichomonads are producing the symptoms. The situation is complicated by the fact that many women harbor the parasites in the vagina and yet complain of no irritation or leukorrhea. There is no evidence that the organisms ever penetrate higher in the genital canal than the vagina. They may be present in the urine.

A very similar organism, Trichomonas hominis, is commonly present in the intestinal canal, where it seemingly produces no symptoms. It has been argued that the two parasites are really identical, and that observed variations in their form and cultural activities depend upon the medium in which they grow. If such identity can be established, the source of the vaginal infection becomes quite evident, but otherwise we have no good idea of the mode of infection.

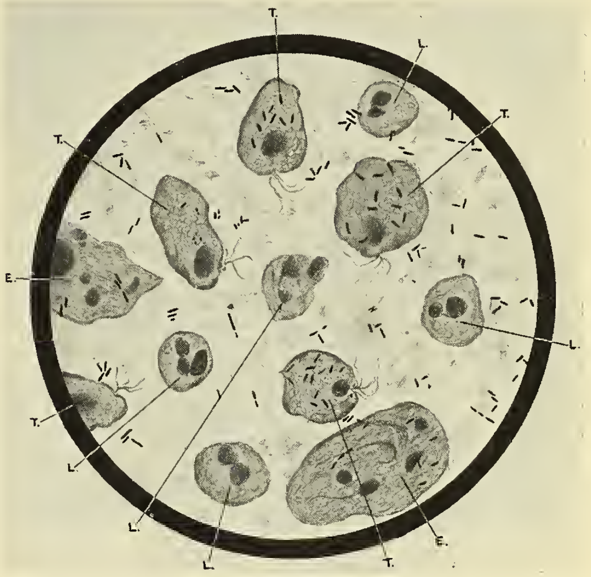

Fig. 1. Drawing of vaginal smear, showing *T*—Trichomonas vaginalis, *L*—Leukocytes, and, *E*—Epithelial cells.

Treatment is unsatisfactory. Many cases respond to various simple medicaments, while occasional patients prove refractory to every form of therapy. Among the methods most frequently advised are:

1. Acid douches—0.5 per cent lactic acid, or corresponding strengths of other organic acids. Lactic acid contraceptive jelly.

2. Drying by a current of warm air from a hair-dryer, or by packing the vagina with kaolin or some similar powder.

3. Cleansing with repeated douches, or, in intractable cases, scrubbing the vagina thoroughly with green soap.

4. Antiseptic solutions, as 1 per cent compound solution of cresol; 1 to 5,000 bichloride of mercury; 1 to 8,000 methylene blue with glycerine; half strength tincture of iodine; 10 per cent boroglyceride; and many others. None of these is specific, but all have their advocates.

With the infection limited apparently to the vagina and with the parasite so easily killed *in vitro,* it is difficult to explain the persistent character of the infection unless one assumes that the organisms burrow beneath the mucous membrane, or that an intestinal infection leads to repeated reinfections. No definite answer to this question can be given at present.

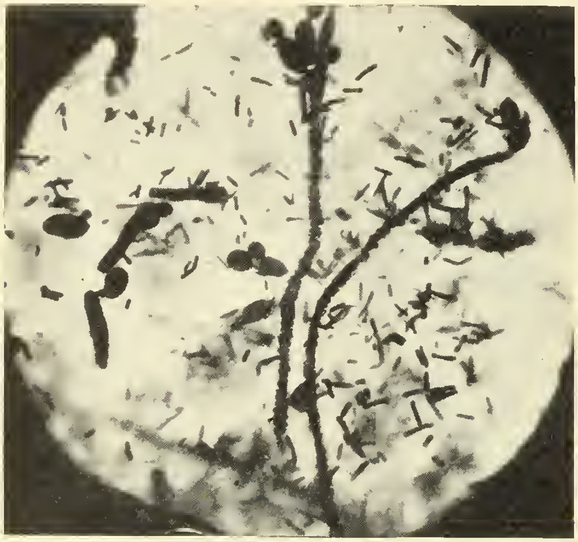

Fig. 2. Vaginal smear showing Monilia—mycelia and conidia—together with many vaginal bacilli and a few leukocytes.

MONILIA VULVO-VAGINITIS

Monilia vulvo-vaginitis is due to infection with the fungus which is commonly recognized as the cause of oral thrush in the newborn. It is predisposed to by pregnancy and diabetes, when presumably the greater acidity of the vaginal discharge favors its growth. The chief symptoms are vulval and vaginal irritation, which may be so extreme as to interfere seriously with sleep, and usually a slightly increased discharge. Examination shows the vagina markedly reddened, with the mucous membrane occasionally granular in appearance. In rare instances, white thrush-like patches of fungus are adherent to the mucosa, which bleeds slightly when the growth is removed. The vulval skin may be irritated and sometimes presents an intertrigo. Examination may be extremely painful. In the non-pregnant, the symptoms are usually worse just before the menses, when the vaginal discharge is more acid, and are relieved by the flow. Symptoms are more common in the latter months of pregnancy, but are usually completely relieved by delivery. In diabetics, insulin and dietary control of the disease frequently cause the symptoms to disappear. The organism is often present without producing symptoms: in 56 out of 156 (36 per cent) of pregnant controls, and in 14 out of 200 (7 per cent) of normal non-pregnant women. Parity seems to increase the chance of infection, but virgins may show the condition. Nothing is known of the mode of infection.

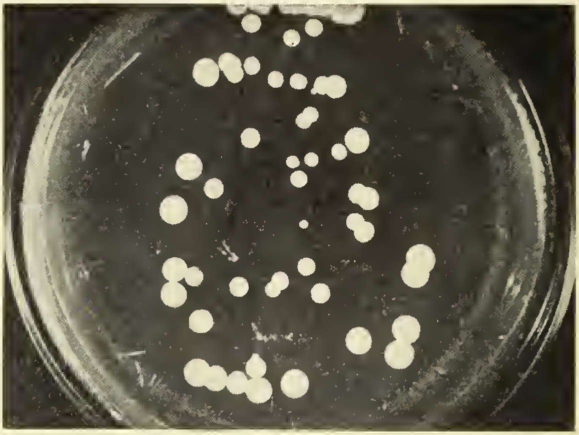

Fig. 3. Forty-eight-hour plate culture of Monilia on Sabouraud's medium.

Diagnosis is occasionally (5 per cent) possible in hanging drop preparations, when the thread-like fungus may be visible, but is somewhat easier in smears stained by the Gram method. The fungi are Gram-positive and appear in two forms, conidia, or spore forms, and mycelia, or thread-like filaments. Culture on Sabouraud's medium (glucose-peptone-agar) adjusted to a P_H of 5.5 is most certain. The organism usually grows in pure culture, although occasionally coccal or bacillary forms will survive the high acidity. Approximately 30 per cent of diagnoses can be made by the smear method, but it is much better to rely upon cultures, when laboratory facilities are available. When grown on artificial culture media, the conidial forms predominate, although old cultures in liquid media or on carrot may show many mycelia.

Treatment: Gentian violet is almost specific and is used in 1 or 2 per cent aqueous solution. The vagina is exposed with a speculum, the accumulated secretion removed with cotton pledgets, and the entire mucosa painted with the dye solution. The surrounding skin also receives a generous application. Treatment may be repeated at intervals of one or two days. In the average case, the application gives almost immediate relief from irritative symptoms, and a few treatments rid the vagina of the fungi.

Our experimental work has proved quite conclusively that this organism is the direct cause of the vaginitis. Direct inoculation with pure cultures has been followed by vaginal and vulval irritation and by an increased discharge within three or four days. Under ordinary circumstances the infection is self-limiting and the vagina becomes clear of organisms within two weeks. It would then seem that special conditions must prevail in the vagina to permit the continued growth of these yeasts, but we have little knowledge of what these conditions may be, except that diabetes and pregnancy make successful accidental or experimental inoculations much easier.

When the infection is present in a pregnant woman at the time of delivery, the child's mouth may become infected and oral thrush may develop. There is no doubt but that certain cases of sporadic thrush appear following this method of contamination. We have been able repeatedly to produce experimental thrush with Monilia cultivated from the vagina. So far, such inoculations have been successful only when the Monilia pinoyi (Castillani) is used, but possibly other forms may be concerned in rare cases of thrush.

The association of Monilia with vulval pruritus in untreated diabetics and its comparative rarity in those who are under effective treatment raises the question of the etiological relationship between the Monilia infection and diabetic pruritus vulvæ. No definite statements can be made at this time, but it seems very probable that the fungus produces the irritation, its growth being favored by the sugar-laden urine.

SUMMARY

Leukorrhea is usually due to infections in the cervix or vagina, only rarely to involvement higher up in the pelvic viscera. In the cervix, endocervicitis represents the most common lesion which is best treated with the fine-wire, electric cautery. Vaginal infections with the Trichomonas vaginalis or with the Monilia group of yeasts may lead to profuse leukorrhea and severe, persistent vaginitis. The former may be treated by a variety of methods, whereas the latter responds well to 1 per cent aqueous gentian violet applied locally.

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WHEN DOES DISEASE BEGIN? CAN THIS BE DETERMINED BY HEALTH EXAMINATION?*

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IT WOULD seem to be easy to speak positively on this subject, but disease may begin in just a few cells and spread quickly or slowly with or without sensation. Fortunately for the patient, but unfortunately for the physician when he is endeavoring to locate the beginning of disease, Nature is able to compensate in various ways for the loss of a quantity of glandular, digestive or absorptive tissue, also of organs of elimination, and, should suffering not ensue, the patient does not realize the deficiency or that he is sick, or that he soon will be appreciably sick. If one kidney is removed the other is able fully to carry on the work; not infrequently there is but one kidney at birth. This is true of all of the double organs, the parathyroid bodies, the suprarenal glands, and so forth. Naturally, this life-saving compensatory effort of Nature's mechanism adds greatly to the problem of medicine. The physician daily sees patients who come for relief of one trouble and who have various symptoms that suggest the possibility of other troubles, and unless a most elaborate series of tests is carried out for at least some of these apparently nonessential conditions, the physician may, and frequently does, miss the beginnings of essential disease. Then the patient again presents himself because of these troubles, when they become a nuisance, in many cases only to be relieved by surgical sacrifice of tissue. Examination must be within reason for the sick, or near-sick, and its extent will be based on the judgment and experience of the physician.

We cannot find out much about slowly developing chronic disease until it is distinctly chronic, which means that there is more or less destruction of tissue or of function, leading the patient to seek relief. However, we do know that in most recurring diseases, and in some chronic diseases, there is a focus if the patient is less than forty years of age, and more than one focus if the patient is more than fifty years of age. We can find out about the acute diseases of childhood, and those which occur after the entrance of organisms with inspired air or with food; some of these organisms are local in effect but sometimes they enter the blood stream and cause general symptoms.

A good many people accept illness as if it were predestined, submitting to it without thought of prevention. The average person has not yet learned the meaning of the term "positive health" and all that it implies in the way of joy of living and efficiency. If we were to adopt the criteria of the public concerning disease, "dis-ease" meaning "parting from ease," there should be some symptom, and the one symptom that all people think of is pain. If there is no discomfort they think there is no disease, unless some accident or injury has taken place, or unless there is some question of muscular trouble; even a growth or tumor may be present without the suspicion of the patient being aroused.

Anything, then, that is a parting from ease leads people to think of disease, and possibly to go to their physicians. If the disease is of their teeth, pain may send them to see their dentists. Yet how many people wait and wait, hoping that the trouble is not serious. Especially is this true of patients who have cancer. Women with a tumor in the breast will put off being examined until it has grown to considerable size or until it gives rise to other symptoms, and then it may be too late, the cancer cells have spread into the lymphatics and have localized in other regions. Adenomas, adenofibromas, or localized mastitis may be the beginning of cancer. When we see patients who have delayed to call on a physician we wonder how much good we are accomplishing by having "Cancer Week" and all the information that is given out in newspapers and by radio concerning prevention of death from this disease. We say to the public "You should come early with cancer," but unfortunately cancer in many situations does not cause symptoms. Only about 2.5 per cent of cancers involve the surface of the body. About 10.5 per cent are in the breast; a little more than 20 per cent involve the genitalia of the male and female, and more than a third involve the stomach. Patients with cancer of the colon rarely present themselves until they have a discharge of blood from the bowels or obstructive symptoms from tumor, kink, or narrowing.

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*Read before the Minnesota State Medical Association, Minneapolis, Minnesota, May 5 and 6, 1931.

After the Wassermann test for syphilis had been discovered, I hoped that some day we might find a test of the blood that would show the presence of cancer, because the majority of cancers are internal and do not give symptoms until they are far advanced. Long since, I gave up the idea that cancer would be discovered early through any blood test, because, in watching postmortem examinations, one finds that many people who have died of pneumonia or all sorts of other troubles have had latent cancer, just as typical cancer as you can get under the microscope. Many of these were of the old Cohnheim type, consisting of a misplacement of tissue, attached to or within the capsule or structure of other organs.

I have some faith in a new test for cancer that is being tried in the west; that is, a chemical test of the urine. It was conceived on the basis that elimination through the kidneys of the waste of abnormal cellular growth might be discovered through appropriate tests. All cells cease to function the moment they become cancerous; nevertheless they have to eliminate something because of their growth, and this is thrown out in the urine. This test has not yet been placed on record. We should experiment along these lines, and from the efforts of many investigators definite results are sure to come.

Tumors of the kidney may attain great size without causing pain or bleeding. Tuberculosis of the kidney may be very far advanced before the patient has the slightest idea that he is sick. Roentgenogram of the lungs tells more in early cases of tuberculosis than does a physical examination. It often reveals all the marks of people of middle age having had tuberculosis long ago. There are the signs of healed processes, even of cavitation, but the process has been stopped for years. I would say that in 50 per cent of these patients you could not elicit any type of history that would give you the period in which the disease first appeared; in fact, many of them cannot remember when they were sick. Thus we have types of disease that do not cause recognized symptoms in their early development. Young people with tuberculosis of the lung might possibly begin to raise sputum, and we find some bacilli of tubercuosis at intervals, but how often the roentgenogram finds evidence of active tuberculosis of the lungs, and yet there are no bacilli in the sputum, or, if bacilli do appear, they are seen only at intervals.

Of 100,000 people today, 160 to 167 die annually from heart disease; it causes sudden deaths, but necropsy reveals that these people had been dying for from ten to twenty years. They had old focal infection and had had round cell infitration in infarctions of the cardiac muscle. When the nerve stimulus from within the heart happens to hit at all points on dead or nonreacting muscle the beat stops, but if one single reacting muscular element had been struck the beat would have been completed, for there was as much working muscle at that time as on the previous day.

The thyroid gland may be lacking at birth, and this gives definite symptoms. Later in life there may be dysfunction such as is seen in exophthalmic goiter, or tumors may develop and be looked on as nuisances, but not as being associated with disease until ill health sends the patients for examination.

Thousands of people have diabetes without realizing it. It may be accidentally discovered, or symptoms may urge them to seek examination. Many of these conditions are out of the realm of early recognition unless persons have physicians whose definite duty it is to look after their health by the year. All of these factors that make recognition of disease uncertain add to the difficulties of the special birthday examination which the medical profession is now urging on the public. They also show how important such examinations will be to both patient and physician.

There is room for more dentists. Just now children are being trained in the care of their teeth. People are discussing for the first time the question of the death of teeth; the conservation of teeth; disease of the jaws; the abscesses that cause no pain because the nerve is dead, a condition that may initiate trouble in any part of the body. They may cause gastric or duodenal ulcers which heal without giving the slightest symptoms, and the scars of which are found at necropsy after death from other causes, or the ulcer may even be active at the time of death without having caused symptoms. The family cannot give a particle of history that will indicate when the patient had symptoms of ulcer. So there must be latent, silent areas in the stomach that are sometimes the site of ulcers which are painless and which cause no reflex symptoms. Bacteria in diseased teeth may also cause renal stones, or diseases of the eye; Rosenow has reproduced these conditions experimentally in animals. It is probably true that local sympathetic disturbance may precede and may pave the way for the deposit of the bacteria which has been carried through the blood stream.

Patients whom we have watched year after year perhaps appear, all of a sudden, with high blood pressure. We do not know what caused it, and we have to try to find out. We have learned much about the sympathetic nervous system during the last few years. These nerves control activity of function. They control circulation by regulating the size of blood vessels. There is some control of glandular output by hormone or what might be called fluid nerves. A deficiency in the blood may be a stimulus for action. Spasm of the vessels of the leg gives pain, intermittent claudication, continued contractions, gangrene, local and acute vascular contracture, loss of fingers and toes, Raynaud's disease, chronic vascular change, and Buerger's disease. All are essentially changes in blood supply; those of great degree cause gangrene. Recently it has been suggested that the circulation of blood in the brain is also more under the influence of the sympathetic nerves than was formerly supposed, and is probably associated with spasm, sudden or slow mental attacks, and certain types of insanity. We often feel the effect of our food in its secondary effect on the sympathetic nervous system. Ducts are opened and closed by the sympathetic nerves, also by the content of food, and this action of the ducts may be held back by spasm of sympathetic origin. The intestines may become spastic; contractions may result in diverticula, and the outlets from one segment to another may become spastic. The so-called abdominal brain is in the upper part of the abdomen. In this area are the liver, pancreas, spleen, suprarenal glands, kidneys, and the stomach, all subject to many changes through many actions of nerves and hormones. Later in life defects appear in bodily sewage, which increase our discomforts. The toxins and bacterial products of the colon must largely pass to the liver through the portal circulation, but the already injured liver is unable to destroy the bacteria or to neutralize the toxic products. The openings in thick walled capillaries fail to permit the passage of the serum, with food for tissues, which may start the vascular changes later recognized as high blood pressure.

When these early conditions are recognized, what are we going to do about it? Not much. It is a great medical problem. We can now recognize these changes only when they are extensive, or when compensation fails, when, in fact, the marvellous human machine breaks and disease becomes manifest which had existed for a long time. Inherited tendencies to disease become a part of this problem, as does special and acquired immunity against infection, or resistance to cellular degeneration or hyperplasia.

If we are going to have supposedly healthy people come to us to be examined to see if they are healthy, physicians need training and more data. It is unusual today for physicians to see enough apparently normal people so that they can form a basis for recognition of early conditions and of not easily demonstrated minor illnesses. The object of all health education is to change the conduct of individual men, women, and children by teaching them to care for their bodies well, and this instruction should be given throughout the entire period of their educational life.

CASE REPORTS

FATAL REACTION FOLLOWING A TRANSFUSION OF CITRATED BLOOD*

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Fatalities following blood transfusions are infrequent. Blood transfusions are not entirely without danger even though the procedure is carefully controlled. The literature contains several cases of unexplainable death following a blood transfusion. A post-transfusion death should be reported in detail so that the information may be complete and be of value in the investigations of this subject.

A male, aged forty-four years, was admitted to the New Asbury hospital on Dr. R. C. Webb's service on September 11, 1931. The patient was in good health up to midnight of September 9, 1931, when he was in an automobile accident. He was riding in the rear seat of a car and at the time of the accident was thrown forward, striking the back of the front seat with his nose. He began to have hemorrhage from his nose immediately. The nose was packed that night by another physician. Hemorrhage from the nose occurred on September 10 and 11. Nasal tampons in the left nostril controlled the hemorrhage temporarily. There was swelling and ecchymosis over the nose and in both lower eyelids. Crepitation was present when the nasal bone was palpated. X-rays showed a comminuted and slightly depressed fracture of the distal portion of the nasal bone.

After entering the hospital the hemorrhage recurred and Dr. L. R. Boies was called as consultant. The nasal septum was found dislocated along the vomer ridge, with a laceration of the septal mucosa on the left side. Hemorrhage was occurring from a branch of the sphenopalatine artery at the posterior portion of the lacerated area. Posterior nasal packs had to be resorted to in order to control the hemorrhage.

On admission to the hospital his temperature was 97.8 degrees, pulse rate 84, respirations 22, blood pressure 104 systolic, 70 diastolic. The temperature remained normal until September 13, when it ranged from 101.4 degrees to 104 degrees; the pulse being 118 to 132 and respirations around 25. The nasal packs were removed on September 14. A small hemorrhage from the left nostril occurred late that evening. On the morning of September 15 the temperature was 99.6 degrees, pulse 108 and respirations 24. The patient did not have any chills with the increased temperature. Clinical examination of the lungs was normal and the physical examination was negative except for the nasal condition. The patient complained of his head feeling full and on September 13 he was drowsy.

Blood examination on September 14 showed r. b. c. —2,600,000; hemoglobin—61 per cent (Sahli); w. b. c. —29,200; the differential count was 92 per cent p. m. n., 6 per cent lymphocytes, 2 per cent large mononuclears. The patient's blood was in Group II. Urinalysis: light amber in color, specific gravity—1.020, acid reaction, trace of albumin, negative for sugar; microscopic examination of the sediment showed 0 to 2 hyaline casts, 10 to 20 granular casts, 3 to 5 pus cells and 0 to 2 blood cells.

A blood transfusion of 400 cubic centimeters citrated blood was given by gravity at 11:50 o'clock a. m. on September 15, using a donor in Group II. Sixty cubic centimeters of 2 per cent sodium citrate were used. Cross matching of the bloods was performed by Dr. Floyd Grave and Miss Grinager prior to the transfusion and there was no agglutination. The blood transfusion was preceded by 200 cubic centimeters normal saline, which was started at 11:45 o'clock a. m., and 500 cubic centimeters normal salt solution was given following the injection of the blood. The intravenous injection of the normal salt solution was ended at 12:20 o'clock p. m.

Ten minutes later the patient had a chill and at 12:45 o'clock p. m. he became irrational. The breathing became labored. There was no cyanosis and the patient expired at 2:03 o'clock p. m.

A post-mortem examination was performed at 4:35 o'clock p. m. by Dr. J. S. McCartney, the findings being:

1. Fracture of nasal bone;
2. Bronchopenumonia, found by microscopic examination;
3. Sphenoid sinusitis;
4. Cloudy swelling of the liver, kidneys and spleen.

There was no blood clotting in any of the vessels and the urine in the bladder was not blood stained.

A recheck of the matching of the bloods was performed by Miss Grinager and the bloods were found compatible.

The indications for the blood transfusion were to check and control the hemorrhage, to replace the blood loss from the continued hemorrhage and to stimulate the formation of blood elements. The hemorrhage had continued to occur even though it was temporarily controlled by mechanical means. The continued use of the posterior nasal pack seemed to be contraindicated due to the elevation of temperature, which was interpreted as being due to infection caused by intranasal manipulation and the injury.

In this case we are confronted with the question of what rôle the blood transfusion had in producing the fatal outcome. The anatomical findings at the postmortem examination are those of an infection, namely, the bronchopenumonia and sinusitis following a fractured nose. None of these conditions would be expected to produce the sudden occurrence of death.

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*Presented before the New Asbury Hospital Staff, Minneapolis, October 7, 1931.

Reactions following blood transfusions have occurred since this procedure was instituted. The reactions may be classified as those due to using incompatible bloods, those produced by chemical substances, as anti-coagulants, and a type of reaction in which the etiology is not known and is referred to as allergic or anaphylactoid reactions.

When giving an incompatible blood the reaction occurs after giving a small amount of blood, 20 to 60 cubic centimeters, and is an indication that the transfusion should be discontinued. In 10,242 blood transfusions collected from the literature by Tiber[10] there were thirteen deaths due to the giving of incompatible blood, the total number of deaths being 22. Grouping of the blood was the method used in determining the compatibility of the bloods in the majority of the cases. This is considered sufficient by many of the writers.[1,2,3,10]

The existence of subgroups within the four major blood groups has been worked out by Guthrie and Huck.[6] When grouping is the only pre-transfusion laboratory work that is done, incompatibility of the bloods in the same group between the recipient and donor will not be detected. The use of a universal donor is advocated by Brines,[2,3] as the incidence of post-transfusion reactions is less when using Group IV donors regardless of what group the recipient is in. It has been noted that the greatest number of reactions occur when donor and recipient belong to Group II. To avoid the using of incompatible bloods, preliminary cross matching will detect the presence of incompatibility within the same group. The blood grouping of an individual remains the same throughout life.

Reactions following the different methods of blood transfusions vary. Citrated blood for transfusion developed by Lewisohn in 1915 has been used more than any other method up to date. Reactions following this method have been reported as occurring in from 10 per cent to 64 per cent[4] of the transfusions. The majority of writers report around 45 per cent. With the development of technic for the transfusion of whole blood, the post-transfusion reactions have been reduced to about 15 per cent.[4,7] In studying this question, a direct action of the sodium citrate on the red cells which promoted hemolysis was found by Drinker and Brittingham.[5]

Fatal reactions following blood transfusions in which the cause is not determinable are about .05 per cent.[3] These reactions have occurred as frequently after one method of transfusion as the other. Brines,[3] using the Unger technic, had two fatalities, one in which the donor and recipient were in Group II and in the other case the donor and recipient were in Group IV. In the second case cross agglutination was done and the findings at autopsy were negative. Using whole blood for the transfusions and having the preliminary hemolysis and agglutination tests negative, Percy[9] reports two cases of fatal hemolysis.

Using citrated blood, with the donor and the recipient in Group II, Witts[11] reports a fatality, where the cross agglutination was negative.

Anuria following a blood transfusion sometimes proves to be a serious complication. It was shown by the experimental work of Baker and Dobbs[11] that the anuria was produced by the obstruction of the renal tubules with the precipitation of blood pigment. The precipitation of the hemoglobin occurred in an acid reaction. The hemoglobin is kept in solution when the urine is alkaline and a hemoglobinuria results but a urinary suppression is avoided. It is suggested that an alkaline diuresis be established preceding a blood transfusion as a prophylactic measure.

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A CASE PRESENTING UNUSUAL UROLOGIC DIAGNOSTIC DIFFICULTIES*

John L. Crenshaw, M.D.
Rochester, Minnesota

A man, aged twenty-seven years, registered at The Mayo Clinic April 10, 1931. In July, 1930, the patient had noticed a bad odor to the urine. He was given medicine by mouth without improvement. A month later while riding in an automobile he felt pain low in the back, as though someone had stuck a knife in his back. This lasted for about three hours and has not recurred. His physician advised him to stop work, which he did, although up to the time of registration he has felt as though he could work. Four months before his admission, pus was found in the urine; this continued to be present. There was no hematuria. Occasionally a stinging, gripping urethral pain occurred for a minute after urination. The stream was of good size and force, although force was needed to expel it; if it was not forced there was dribbling and pain. At times he voided fairly clear urine and in five to ten minutes, after exertion or stool, passed several ounces of thick, stinking pus. He passed urine one to two times at night. In July and August he had had a few chills and had had a little fever occasionally. Eight years before he came to the clinic, and even before that, he had had frequent epistaxis. His appetite was poor. Four years before examination, while walking on the street he suddenly lost consciousness for ten minutes. In September, 1930, while in a hot room he felt dizzy and nauseated, and went outside to vomit. The attack lasted twenty minutes. He has slept well.

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*From the section on Urology, The Mayo Clinic, Rochester, Minnesota. Read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

The patient's weight was normal, 170 pounds. Systolic blood pressure was 125 and the diastolic 95 in millimeters of mercury. The pulse was 90 and the temperature 99° F. at 5 p. m. The results of general examination were negative. There was no resistance or tenderness anywhere over the abdomen or in the region of the prostate gland or kidney. On rectal examination the prostate gland was found to be enlarged graded 2, and soft and boggy. The tonsils were enlarged graded 3 and contained plugs. Pyorrhea graded 1 was present; this needed local attention only. The concentration of urea was 18 mg. in each 100 c.c. of blood. Combined excretion after intravenous injection of phenolsulphonphthalein was 60 per cent in two hours. The urine was normal in amount and the specific gravity was 1.023; it was alkaline, contained a trace of albumin, erythrocytes graded 2, and pus graded 4, but no sugar was present. Both glasses of a two glass test of the urine also showed pus graded 4. Stains of the urine for the bacillus of tuberculosis were negative. Examination of the blood, the Wassermann reaction of the blood, roentgenograms of the thorax and of the colon and urinary tract, all were negative.

Cystoscopic examination disclosed chronic cicatricial and granular urethritis graded 3 with purulent secretion graded 3 from the prostatic ducts. There was no residual urine and nothing to suggest a neurogenic disorder of the bladder. Irritability was marked, and foul, purulent cystitis with bullous edema graded 3 across the base, particularly on the left side, made it impossible to see either meatus. A cystogram showed the outline of a normal bladder without diverticulum or trabeculation.

A diagnosis was made of marked cystitis with bullous edema of the base of the bladder which was suggestive of an extravesical lesion on the left side, moderate chronic prostatitis and seminal vesiculitis with purulent secretion from the prostatic ducts, and secondary chronic urethritis. The possibilities considered at this time were: (1) prostatic or seminal vesicular abscess draining through the urinary tract; (2) vesico-intestinal fistula; (3) diverticulum of the bladder; and (4) pyonephrosis.

After prolonged irrigation of the bladder a second cystoscopic examination was made. The cystitis had improved although considerable edema remained in the left base of the bladder. Both ureteral meatuses were normal, and intravenous injection of indigo carmine returned in four minutes from both sides was of normal concentration. The left ureter was catheterized and normal urine was obtained. A left pyelo-ureterogram showed normal pelvis and ureter. Several days later an intravenous urogram was made to exclude the possibility of a second pelvis on the left, but this showed only the one normal sized pelvis on that side. The patient in the meantime was showing increasing evidences of sepsis. What, then, was the source of the pyuria?

On close observation the pyelogram of the left pelvis (Fig. 1), although normal in outline, was found to be displaced outward and downward and did not seem to compensate in size for the large, soft tissue outline of the left kidney. Therefore a diagnosis was made of complete duplication of the pelvis of the left kidney, the lower pelvis being normal, and the upper, pyonephrotic and functionless; the ureteral orifice from the upper segment was lost in the marked bullous edema of the left base of the bladder.

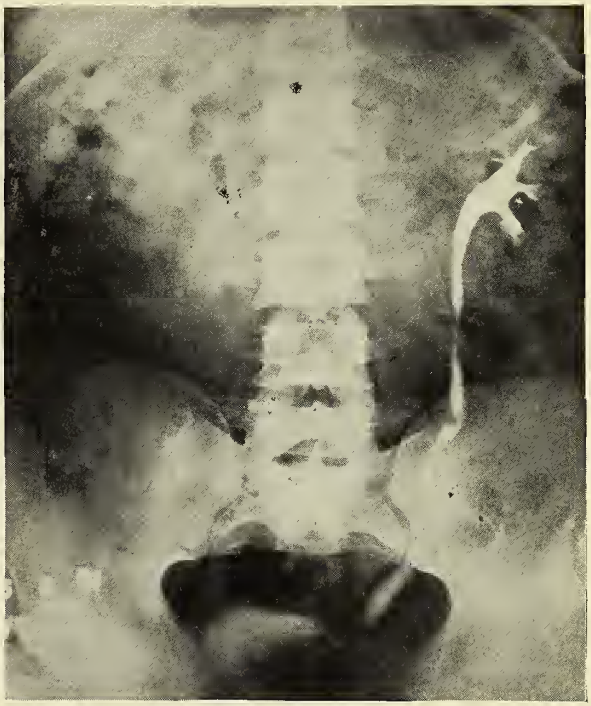

Fig. 1. Outward and downward displacement of the left pelvis.

Exploration of the left kidney May 25, 1931, disclosed complete duplication of the left renal pelvis and ureter and pyonephrosis of the upper part of the pelvis. Heminephrectomy was performed.

CONCLUSIONS

In obscure urologic conditions one must bear in mind: (1) the possibility of an anomaly and also the possibility, if the kidney is concerned, of one of its segments being functionless and therefore not outlined in an intravenous urogram and not giving a return of dye; (2) a comparison of the size of the pelvic outline with the size of the soft shadow of the kidney is often suggestive of a second pelvis being present; and (3) pyonephrosis may be present in spite of the complete absence of pain or tenderness in the region of the kidney.

ACUTE VASOSPASTIC HYPERTENSIVE DISEASE WITH TRANSITION INTO MALIGNANT HYPERTENSION

REPORT OF CASE

Charles Koenigsberger, M.D., *Mankato*
and
E. G. Bannick, M.D., *Rochester*

REPORT OF DR. KOENIGSBERGER

During the 1930 meeting of the Southern Minnesota Medical Association, Dr. Edwin Bannick and I reported an unusual case of hypertension. Certain developments in this case since our report are of sufficient interest to bring to your attention at this time. I will briefly summarize our report of last year, together with a few remarks concerning the progress of the patient since that time, and Dr. Bannick will conclude with a report of his examination made within the past few weeks.

This patient came to me in February, 1930. His age was 29 years. About two months before, he had had a severe attack of septic sore throat. During convalescence a tonsillectomy was done by his local physician. A few days after this he commenced having very severe upper abdominal colic, so severe that his physician considered biliary or renal colic. When he came to us we hospitalized him for observation and treatment. At this time the striking objective data were a vascular tension of 180/140 and a rapid heart rate with a gallop rhythm. The heart was not demonstrably enlarged. The vessel at the wrist showed very little, if any, thickening. The retinal vessels showed no sclerosis but some reduction in the caliber of the arteries. There was no retinitis. The urine and blood were normal, as were the routine tests of renal function.

During his stay in the hospital he had repeated attacks of three different types of pain:

1. Abdominal: The pain was severe, cramping in type, and unaccompanied by fever, vomiting, or physical signs of visceral disease.
2. Cerebral: The pain was that of a generalized, very severe headache.
3. Coronary: The pain was that of a typical attack of angina pectoris. Hypodermic administration of a quarter of a grain of morphine with one-hundredth of a grain of nitroglycerine invariably produced immediate relief. The use of nitroglycerine alone caused immediate cessation of pain, but the relief was very transitory unless the drug was combined with morphine.

The kidneys at no time gave trouble. The intake and output balanced well, and there was at no time evidence of any glomerulonephritis.

The eye-grounds also remained clear of exudates or hemorrhages. The heart gave a great deal of trouble symptomatically. Anginal attacks of extreme severity continued almost daily for about five weeks.

During his entire illness, the blood pressure remained systolic 150 to 180 and diastolic 110 to 140, and on April 26, when I last saw him in the office, the reading was 170/120.

This, then, is a case of acute diffuse vasopastic disease following a streptococcic throat infection characterized by striking involvement of the splanchnic, cerebral, and cardiac vessels.

From the first I considered the existence of malignant hypertension, but the lack of retinal findings or renal insufficiency precluded this diagnosis.

During April, 1931, a little more than a year later than the time covered by our report, I saw this patient again. At this time he was apparently in relatively good condition. He had gained about 40 pounds in weight and felt, in general, fairly well. He had very little headache or pain of any sort. He did, however, have a little pain around the heart on exertion. He was able to walk four or five miles slowly without special fatigue. Physical examination was about as before although the blood pressure was 200/150, the artery in the wrist showed a little more thickening, and the urine contained some albumin with a few hyalin and leukocytic casts but no blood. The examination of the retina showed irregularity of the lumen of the arteries. Notching was present, but there were no hemorrhages or exudate. The blood chemistry was normal; an electrocardiogram showed no significant changes.

At this time Dr. Bannick said to me that he would like to see this patient; I, therefore, asked that he report to Dr. Bannick, which he did about three months later. Dr. Bannick will report his findings at that time.

REPORT OF DR. BANNICK

The case presented by Dr. Koenigsberger is the most unusual example of acute vasospastic hypertensive disease that I have ever seen. I have never seen a case in which the symptoms were so severe, nor could I find a record of one in the literature. The acute hypertension associated with toxemia of pregnancy is similar in many ways, but the extremely severe abdominal cramps, and the terrific angina pectoris are practically unheard of among patients as young as this man. The diagnosis, therefore, was correctly made, not from personal experience or from study of the literature, but by exclusion. Since then, the patient has developed classical malignant hypertension with associated renal injury, all of which merits further interest and consideration.

When I first saw him, in consultation, February 21, 1930, he was in a critical condition. Nephritis was easily excluded by the persistently normal urine, by the normal results from tests of renal function, and by the absence of edema and anemia. That the hypertensive phenomenon was acute was suggested by the history and the facts that the heart was not enlarged, there was no retinitis, and no demonstrable arteriosclerosis either in the radial or retinal vessels. A diagnosis was made of acute vasospastic hypertensive disease, and treatment was given accordingly. The ultimate prognosis was guarded and the immediate prognosis was grave, although the patient's relatives were assured that, if the vasospasm could be relieved, at least temporary recovery might take place. As Dr. Koenigsberger has noted, after several weeks of rather severe symptoms the acute crises subsided, and the patient was dismissed from the hospital. The biopsy of the pectoral muscle done shortly after this for study of the arterioles disclosed a normal ratio of wall to lumen; the diameter of the lumen was approximately twice the thickness of the wall, and at first glance the arterioles seemed normal. Closer analysis revealed some increase in the nuclei in both intima and media and suggested that a reaction of some sort was going on in the wall of the vessel, but the arteriolar study definitely confirmed the previous impression that the hypertensive phenomenon was not of long standing (Fig. 1).

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*Presented before the annual meeting of the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

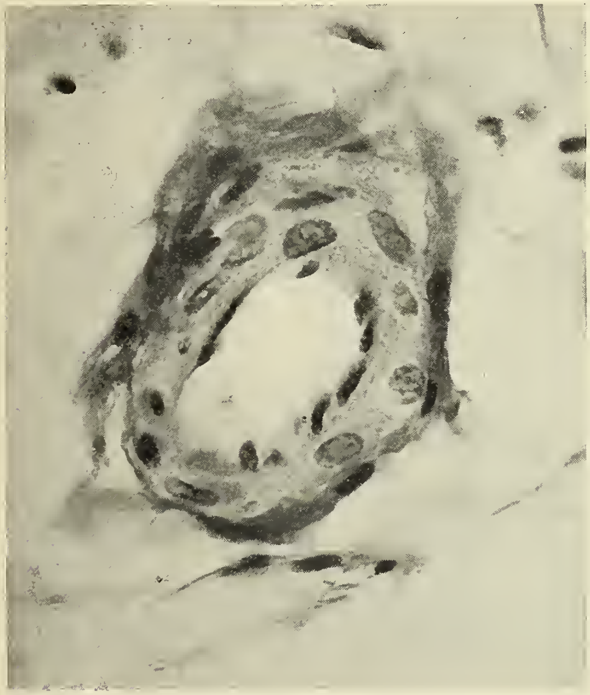

Fig. 1.

Dr. Koenigsberger reported that about a year later, or five months ago, the patient's condition had not changed much, although there were some signs of arteriosclerosis and increasing hypertension with some albuminuria, but when the patient reported at the Clinic on July 27, 1931, a considerable change in the findings was noted. Albuminuria was graded 2 to 3; the urine did not contain blood, but a few casts were seen. Excretion of phenolsulphonephthalein was 45 per cent in two hours. There was no anemia. The concentration of urea was 20 mg. in each 100 c.c. of blood, and of sulphates 6.03 mg. in each 100 c.c. of serum. Blood pressure was 225 systolic and 160 diastolic, and a record of the blood pressure for twenty-four hours showed that it stayed persistently high even at rest. The patient's heart was now definitely enlarged (graded 1 to

ACUTE VASOSPASTIC HYPERTENSIVE DISEASE
(Transition into Typical Malignant Hypertension)
Male—Age twenty-nine years
OBJECTIVE DATA

Dates	Urine				Blood			Blood Pressure Mm. mercury	Heart			Arteriosclerosis		Retinitis	Muscle Biopsy (Arteriolar Study)
	Albumin (grade)	Blood (grade)	Casts (grade)	Phenol-sulphone-phthalein % —2 hours	Anemia	Urea Mgm. %	Serum Sulphates Mgm. %		Hypertrophy (grade)	Significant E.C.G. changes	Gallop Rhythm	Radial (grade)	Retinal (grade)		
Jan., 1930															
2-21-30	0	0	0	Normal	0	Normal		S180 D140	0	Yes	Yes	0	0 some slight constriction	0	
4-26-30	0	0	0					S170 D120				0	0	0	Normal wall to lumen ratio. Some proliferation of both intimal and medial nuclei.
Apr., 1931	Some	0	Some		0	Normal		S200 D150				I to II	I to II	0	
7-29-31	II to III	0	0 to I	45%	0	20	6.03	S225 D160	I to II	Yes	Yes	III	II to III	Typical malignant hypertension type	Wall to lumen ratio 1:1. Marked increase in intimal and medial nuclei. Some arterioles completely closed—proliferation.

Severe streptococcic sore throat—followed by tonsillectomy.

2). In the electrocardiogram, among incidental findings was evidence of marked left ventricular preponderance, and a diphasic T wave in Lead I; gallop rhythm was still present. Considerable arteriosclerosis was now easily demonstrated, graded about 3 in the radial arteries and graded 2 to 3 in the retinal vessels. There was a type of retinitis typical of malignant hypertension with bilateral edema of the disks, sclerosis of the vessels, and exudates and hemorrhages. The albuminuria, the slight reduction in excretion of phenolsulphonephthalein, and the slight but definite elevation in the concentration of serum sulphates at this time suggested definite renal involvement and early renal insufficiency. The great disproportion between these renal findings, and the marked evidence of hypertensive and vascular disease, suggested strongly that the renal insufficiency was the result of arteriolar disease and vasospasm, and not of glomerulonephritis.

This is all the more convincing when note is taken of the repeatedly negative urinary findings in the presence of increasing cardiovascular and hypertensive disease. Another biopsy was obtained of the pectoral muscle at this time for further arteriolar study and for comparison with the previous biopsy. In this specimen, too, striking changes were seen. The ratio of wall to lumen now was as 1 to 1, showing that the thickness of the wall of the arterioles was practically twice that seen at the previous biopsy. There was marked increase in the number of nuclei in the intima and media (Fig. 2), and some of the arterioles were completely closed, apparently by intimal proliferation (Fig. 3). A diagnosis was made, therefore, of diffuse arteriolar disease, with malignant hypertension and early renal insufficiency, and the prognosis is extremely poor.

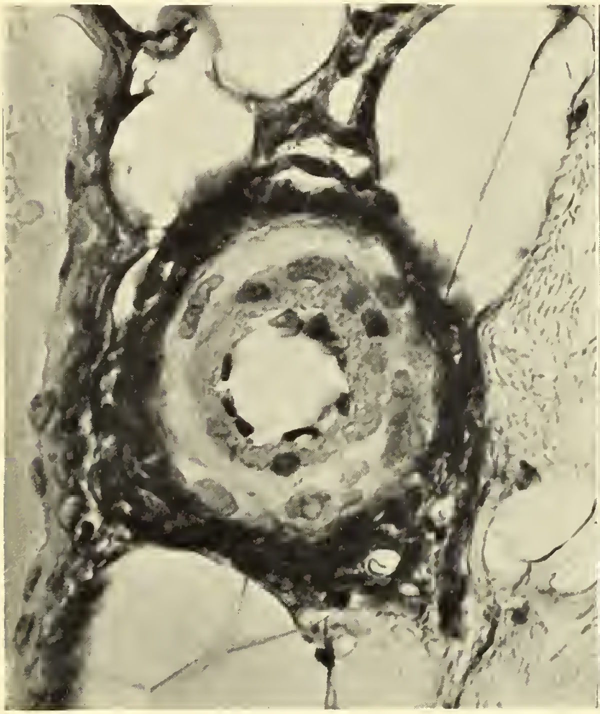

Fig. 2.

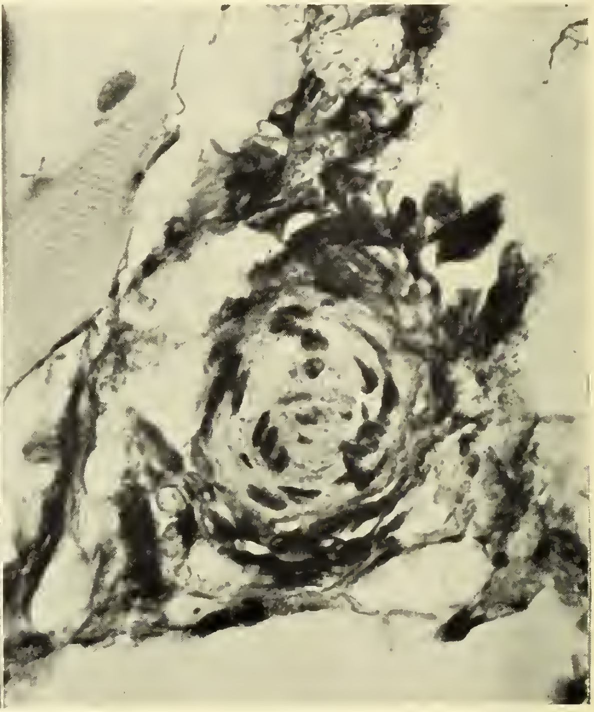

Fig. 3.

In conclusion, then: (1) development of malignant hypertension with albuminuria and early renal insufficiency came as a result of arteriolar injury and vasospasm, and not as a result of glomerulonephritis; (2) marked arteriolar involvement was proved by study of biopsy of pectoral muscle; (3) vasospasm was the chief factor at the onset, and preceded demonstrable significant arteriolar disease; (4) the diffuse vasospasm involved arteries as well as arterioles, as suggested by the angina pectoris and abdominal crises, although my impression is that angina pectoris in cases like this is not all due to coronary spasm but also to acute cardiac strain; and (5) the history of the onset suggests acute streptococcic infection as the chief etiologic factor.

PRESIDENT’S LETTER

IT IS an established custom that the President of the Minnesota State Medical Association write an open letter each month to the members for publication in Minnesota Medicine.

In this, my first letter, I want to thank the profession of the State from the bottom of my heart for the honor bestowed upon me. Born in this state and living amongst you since graduation, my shortcomings must be known to many and I wonder that I have been so signally honored. The medical profession of Minnesota has always been in the vanguard of medical progress, a fact that makes the responsibility of the office greater. My first plea is Doctor Sogge’s final plea, that all members read the columns of Minnesota Medicine closely, not only for its scientific value but for the information it contains concerning the economics of medicine that are looming up so prominently on our horizon.

Our Association is a prosperous, active, and vigorous organization. My efforts will be directed toward holding fast to the present high standards and increasing in any way possible the usefulness of the society to the members. Already plans are well started for the annual meeting this year to be held in Saint Paul, May 23, 24 and 25. Bear these dates in mind and plan to be there for the Committee on Scientific Assembly are preparing a program that will be one no member can afford to miss.

The year 1931 was full of worries, and many problems confront the people of the United States. The medical profession as an integral part of the social and economic structure of the country must share in good times and bad times. The type of medical service rendered the people is second to that of no other nation and has been administered in a democratic and independent manner free of governmental interference—typically American. The medical profession has not only fostered but sought the type of governmental aid that will enhance this service as evidenced by State Boards of Health, State Licensing Boards, the establishment of hospitals for chronic conditions such as poor crippled children, the mentally sick, the blind, deaf and the tuberculous, the burden of which must be borne by the society as a whole.

A bureaucracy may start out to be beneficial, but easily becomes questionably beneficial and inefficient. Bureaucratic medicine is sure to lead to an inferior type of medicine when it attempts to take care of the ordinary run of the ills that the general population is subject to.

There is not the slightest doubt in my mind that medicine as it has been and is practiced today in the United Statees is threatened if the plan as outlined by the Veterans’ Bureau is carried through to fulfillment. Needless to say, we all want the sick or injured veteran to have the best our country can offer. If the facts were known by the people concerning the high cost of the building, equipping, maintaining these hospitals, and providing care for the patients, they would question the expenditure of the vast sums required. There appear to be ample beds in civilian hospitals to take care of any overflow above the present capacity of the Veterans’ Hospitals. It is high time that these facts were known and it is the duty of organized medicine to do its best to aidindisseminating such information. Our profession may be accused of selfish motives but its past record of unselfish devotion toward the eradication of disease and the care of the sick or injured without thought of compensation whenever necessary is adequate answer.

Our taxation system is faulty in that only a small number are made to feel that they are partners in the enterprise of running our country. It looks, however, as though a day of reckoning were at hand. More people must pay direct taxes and consequently will be in a receptive mood for economics. We must not fail to point out forcibly to them the great expense of any such undertaking as that outlined by the Veterans’ Bureau and boldly question the type of medical service that will be rendered. Two past presidents of this association are on the recently appointed legislative committee of the American Medical Association, C. B. Wright and Herman Johnson. That committee is gathering information and advocating measures that will be in line with American policies. An editorial entitled, “State Medicine and 4,000,000 Veterans” in the last number of Minnesota Medicine is well worth reading.

M. S. Henderson.

President,
Minnesota State Medical Association.

Melvin S. Henderson, M.D.
President, Minnesota State Medical Association, 1932

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

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OXYGENATION

The factor of anoxemia in pain production in coronary disease and the sequences in coronary thrombosis and obstruction is now accepted. Barach* has recently discussed the favorable influence upon certain congestive types of myocardial failure after the prolonged inhalation of an atmosphere containing 35 to 45 per cent of oxygen. The scant elevation of 3 to 5 per cent in arterial oxygen saturation seems to account for the patient's enhanced comfort, freedom from pain and protracted dyspnea and an increase of the carbon dioxid in the blood. In like manner, it appears that sloughs and ulcers in thrombotic varicosities are strikingly healed by McPheeters' method, whereby with the application of rubber sponges, with suitable bandages, the patient's muscular effort in walking brings oxygenated arterial blood into the areas. Thus, it would seem that normal tissues promptly suffer when deprived of oxygen and die if the lack is prolonged. Oxygen is needed for energy development and waste disposal.

In terms of this outlook, physicians should observe the basis of the work done by Professor Otto Warburg, which has given him this year the Nobel Prize in Medicine. His studies of blood ferments and oxygen conveyance, as well as the tracing of the events in plant cell photochemical synthesis, have drawn attention to his exactitude in measurements and an attempt to link up biology with the newer physics, even as chemistry has been absorbed by it. His work has further led him into a study of the relationship of oxygen to the metabolism of malignant or cancer cells. He has shown that, like anaërobic bacteria, they can live without oxygen, securing their pabulum from sugar destruction. From this no one draws the conclusion, on account of this common attribute, that cancer may have a bacterial origin; rather does this fact suggest that both bacteria and cancer cells are primitive entities. It recalls the interesting popular writings of Haldane, where in terms of circulation and oxygen availability he explained the limitations of such varied organisms as beetles and elephants, establishing the rôle of oxygen availability in determining both the physiologic capacity and morphologic attributes.

E. L. T.

THE LEGION'S ATTITUDE TO THE SHOULDERS RESOLUTION

We are reproducing an editorial which appeared in the December number of an American Legion publication known as the *"Forty and Eighter"*:

THE LEGION DIFFERS WITH THE DOCTOR

The American Medical Association has opened fire on the Legion hospitalization program for disabled veterans. In opposition to the Legion plan for giving all disabled veterans needed hospital treatment in government hospitals, the Association, through its *Bulletin*, suggests a plan for disability and hospital insurance for veterans with which they could pay for private treatment in civilian hospitals. Study of this plan shows that it would be much more costly to the government and the results for the veterans in all probability would be less satisfactory.

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*Barach, Alvan L.: Therapeutic Use of Oxygen in Heart Disease. Annals of Internal Medicine, October, 1931, 5:428.

The average cost of caring for a veteran in a government hospital is $3.84 per day, according to Watson B. Miller, chairman of the Legion's National Rehabilitation Committee, while the average cost of caring for a veteran in a civilian hospital under contract is $4.59 per day, or nearly a dollar a day more. In the civilian hospitals many additional charges are made such as for surgeons' and internists' services, nursing, operating room, drugs, etc., making the actual per diem cost very much more than in government hospitals.

All Veterans' Bureau Hospitals are approved by the American College of Surgeons, which means that the practice of medicine in these hospitals is according to the standards set up by this body. This fact does not apply to all civilian hospitals. Very few Neuropsychiatric and Tuberculosis hospitals are approved by the American College of Surgeons. This is very important because so many of the disabled veterans are being hospitalized for tuberculosis and neuropsychiatric diseases. Where would these men go for proper care if the government hospitals were not open to them?

Civilian hospitals from many standpoints are not in position to care for disabled veterans as economically or as effectively as government hospitals. The Legion must continue to differ with the opinion of the American Medical Association as expressed in its *Bulletin* and continue to support the Legion program of hospitalization for all disabled veterans in government hospitals.

This expresses the opinion of certain members of the Legion regarding the change in the method of hospitalization of war veterans as embodied in the Shoulders Resolution.* That there would not be a unanimous acceptance by the Legion of this change in policy was a foregone conclusion. As a matter of fact, however, many Legion Posts, after having the all around advantages of the change explained to the members, have approved the proposal. If the majority of the Posts favor the change, Congress is more than likely to accede to the Legion's wishes.

If Secretary Mellon's proposed increase in Federal income tax becomes effective there will be a lot more taxpayers interested in governmental economy in the future. Comparative figures as to per diem cost in government and private hospitals are not available. Most private hospitals have more or less endowment in the form at least of buildings and equipment and are not run at a profit so that it does not seem likely that the government can furnish the same hospital care for a less per diem cost. The important consideration from an economy standpoint is that the present program of the Veterans' Bureau will necessitate the construction of many Veterans' hospitals to provide the necessary hundred thousand additional beds. This is obviously a much more expensive program than utilizing the already existing private hospitals.

There are plenty of private hospitals which have received the approval of the American College of Surgeons, if the Legion wishes to limit the care of veterans to approved institutions.

It is true that there are not sufficient beds in private tuberculosis and neuropsychiatric hospitals to care for veterans thus afflicted. Most individuals needing such care are at present provided for at public expense by the individual states. If the veterans prefer federal to state care for such of their number as need it, this should make no difference to the taxpayers.

The Shoulders plan does not propose a remedy to meet a situation affecting the medical profession alone. There is in fact no provision in the Shoulders plan for remuneration of the doctor by the government. Each community has funds invested in its hospitals. Are new government hospitals to be built to the detriment of these community institutions? How are the taxpayers going to react to such extravagance? This matter is a vital one for many so-called private hospitals.

From the standpoint of the professional service secured by the veteran, will he voluntarily choose an unknown government doctor instead of the private doctor he knows personally or by reputation?

There is evidently a minority in the Legion bent on convincing the others that government care is superior to care in private rospitals under private physicians. Members of the medical profession should be interested in this most important problem so threatening to private practice. Many doctors are members of their local Legion Posts and can exert an influence locally in favor of a change so important not only for the veteran but for medical practice, hospitals and the taxpayer.

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*Full information regarding the Shoulders Resolution is contained in the *A. M. A. Bulletin* for October, 1931.

MERCIFUL MURDER

A Danish woman deliberately gives her mother an overdose of medicine and kills her. The mother and daughter both believed the painful illness incurable, the mother had failed in an attempt at suicide and the daughter, to save her mother from the penalty of suicide in the next world, took upon herself the duties of judge, jury and executioner. And then it developed that the mother's affliction was gallstones and presumably could have been cured.

Such loose thinking, in the guise of advanced thought, should probably be ignored. This is, however, not the first reported instance of the kind. We are reminded of the surgeon son in the English novel "Sorrel and Son" who similarly assisted his father, suffering from an incurable cancer, out of this world as an act of mercy. It is difficult to judge the motive of an author in apparently approving such an act. We suspect sensationalism. Certainly an overemphasis was placed on an emotional reaction rather than straight thinking.

If a daughter has a moral right to put her mother out of misery, a mother has the same right with respect to her mentally deficient or crippled child. The state should also have the same moral right to execute idiots and the feeble-minded as well as criminals. While such a procedure would be an easy solution of a serious economic problem, it certainly would not meet the approval of an enlightened civilization.

The physician only too frequently encounters a patient for whom death would seem a blessing for all concerned. The judgment of any individual or group of human beings, however, is not infallible. Not rarely is the diagnosis of the best medical minds wrong. The supposedly permanently insane person recovers his sanity, the apparently non-viable newborn babe decides to live and eventually proves to be a genius, the incurable cancer patient lives many years to die of another malady.

Who would be eager to seek the services of a physician who might consider it his moral right to dispatch him to eternity if the diagnosis justified?

It seems to be ofttimes forgotten that pain can be largely relieved and nature is frequently capable of performing seeming miracles. We know something about the prevention and cure of conditions that so frequently make life unbearable. Much has to be learned, however, particularly in this field of prevention, before it can be applied. In the meantime the problem must be met with the present methods without resort to murder.

MEDICAL CARE OF THE POOR

At the Secretaries Conference January 23, 1932, we plan to have a symposium on "Medical Care of the Poor." This subject has created a good deal of interest throughout the State and, of course, has acquired added importance on account of the present depression. Doctors in many parts of the State are finding that their present relations with the various boards of County Commissioners are unsatisfactory. Some counties are making arrangements similar to those that have been made in Iowa, and some have been using a plan similar to that used in Polk County, Wisconsin.

We are planning to have a discussion as to the availability of these and other plans in Minnesota. In order that you may know the present law in Minnesota as a basis for your discussions, the extracts printed below are published. Please read them carefully and discuss them with the secretary of your county society so that he may come to the Conference with some definite ideas.

Mason's Statutes—Minn. 1927—3174—*Board to Appoint Physician.*—The board shall appoint one or more practicing physicians to be physicians of the poor who shall hold office during the pleasure of the board, and receive such compensation as it may from time to time determine. If more than one be appointed, the order of appointment shall prescribe the district in which each shall act, and none shall be required to act outside of his district except in case of urgency. When directed by a member of the board or by the overseer, such physician shall attend upon and prescribe for any sick poor person in charge of the overseer, and also on written direction of a member of the board shall attend upon and prescribe for any sick poor person who is entitled to receive support or relief from the county. If immediate treatment of any person who has been declared a county charge be required, any licensed physician who may prescribe for or treat him before the arrival of the county physician shall be paid therefor. He shall at once notify the county physician who shall thereupon take charge of the case. Within thirty days thereafter, he shall file with the auditor a verified report, showing the name and residence of the patient, the day and hour when called, the distance traveled in going to such place, the nature of the disease or injury, the service performed, the time when the county physician was notified and took charge, and the amount claimed as compensation. The auditor shall present such report at the next meeting of the board, which shall allow reasonable compensation.

(1501) /3084/ 25—259; 95—201, 103 + 1023

Minn. Reports—Vol. 25, P. 259. 9/20/78.—A contract of employment, made by a single county commissioner with a physician, for professional services to be rendered to a sick pauper entitled to relief from the county of such commissioner, is unauthorized by the provisions of Gen. St. C. 15, and not obligatory on the county.

" . . . . A county commissioner has no authority to employ, upon the credit of his county, a physician not thus appointed (by the board); and if he does, the unauthorized appointment will create no liability against the county. Though the plaintiff in this case may have acted in good faith in relying upon the certificates and the requests therein contained, this furnishes no ground for his claim against the county, for the law imputes to him full knowledge that the officer with whom he dealt had no authority in the premises."

Minn. Reports, Vol. 95, P. 201. June 16, 1905.—Where the town supervisors are required to provide for the care and support of the poor therein, and have no regular physician to attend its paupers, and a pauper suffers from an accident which requires the immediate attention of a surgeon, who renders services to relieve the necessity, he may recover reasonable compensation from the town, although he had not been requested by the authorities to attend the patient.

Committee on State Health Relations.
Theodore H. Sweetser, *Chairman.*

OF GENERAL INTEREST

Dr. J. A. Roy was recently elected mayor of Red Lake Falls.

Dr. Morris Greenberg has located at Robbinsdale, Minnesota, where he is doing general practice.

Dr. W. E. Richardson, Pipestone, has moved to Phillip, South Dakota, where he will engage in general practice.

Dr. C. M. Robilliard has been appointed to succeed his father, the late Dr. W. H. Robilliard, as physician to the State School for the Deaf at Faribault.

Dr. C. H. Sherman announces the opening of offices at 720 Lowry Medical Arts Building, Saint Paul, for the practice of surgery.

Dr. A. H. Parks was elected Chief of Staff of Asbury Hospital, Minneapolis, at the recent annual meeting of the staff members.

Dr. J. R. Kuth and Dr. M. H. Tibbets, Duluth, addressed academy members on "X-ray Interpretations of Orthopedic Conditions of the Spine."

Dr. Eskel Erickson, formerly of Garretson, South Dakota, has purchased the practice of Dr. L. N. Casney at Halstad, Minnesota.

The tenth anniversary of the founding of Lymanhurst school for tuberculous children, Minneapolis, was celebrated by a program given at the school Wednesday, December 2.

Dr. Henry L. Ulrich, Minneapolis, was elected president of the Minnesota Society of Internal Medicine at its last meeting in November. Dr. Moses Barron, Minneapolis, was elected secretary-treasurer of the organization.

Dr. Edwin J. Simons of Swanville was awarded the 1931 prize of $250 offered each year by the Minnesota Society of Internal Medicine to the practitioner of medicine in the state who has made the most valuable contribution to medical knowledge. The monograph submitted by Dr. Simons was on primary carcinoma of the lung.

The American Board of Ophthalmic Examinations will hold an examination in New Orleans on Monday, May 9, 1932, at the time of the meeting of the American Medical Association. Application blanks may be secured from the secretary, Dr. William H. Wilder, 122 South Michigan Avenue, Chicago, and should be submitted at least sixty days before the date of examination.

The Minnesota State Medical Association and the Minnesota State Hospital Association will conduct joint 1932 sessions in Saint Paul, May 23 to 25. The meeting, which will mark the seventy-ninth anniversary of the state medical association and the thirty-third of the hospital organization, will be the first time the two groups have convened together. Scientific sessions will be conducted jointly.

At the annual meeting of the Interurban Academy of Medicine, an organization of Superior and Duluth physicians, held Wednesday, November 18, 1931, Dr. V. E. Ekblad, Superior, was elected president for the ensuing year. Dr. Ekblad succeeds Dr. George L. Berdez, Duluth.

Dr. Mario Fischer, Duluth, was named vice-president; Dr. H. A. Sincock, Superior, secretary and treasurer, and Dr. P. S. Rudie, Duluth, censor.

Dr. Harry P. Ritchie, St. Paul, was elected president of the Western Surgical Association at its recent meeting held in Denver. He succeeds Dr. Carl E. Black of Jacksonville, Illinois, who will take Dr. Ritchie's place as recorder. Dr. Clifford W. Collins of Peoria, Illinois, was elected first vice president; Dr. Edward L. Gilcreest, San Francisco, second vice president; and Dr. Frank R. Teachenor, Kansas City, secretary-treasurer. For a number of years Dr. Ritchie was secretary of the organization and when the duties of this office were divided among secretary, treasurer and recorder, Dr. Ritchie became recorder, with supervision of publications.

The American Association for the Study of Goiter again offers an award of $300 for the best essay based upon original research work on any phase of goiter presented at their annual meeting in Hamilton, Ontario, Canada, June 14, 15, and 16, 1932. It is hoped this offer will stimulate valuable research work, especially in regard to the basic cause of goiter.

Competing manuscripts must be in English and in the hands of the Corresponding Secretary, J. R. Young, M.D., Rose Dispensary Bldg., Terre Haute, Indiana, not later than March 15, 1932.

The first award of the 1931 Kansas City, Missouri, meeting was given Dr. Bruce Webster, Presbyterian Hospital, New York City, "Studies in the Etiology and Nature of Simple Goiter as produced Experimentally in Rabbits."

Dr. C. O. Rice, Minneapolis, among others, received honorable mention for his paper on "Life Cycle of the Thyroid Gland in Minnesota."

On the evening of December 17 a complimentary banquet was tendered Dr. John L. Rothrock of Saint Paul at the Minnesota Club by members of the Ramsey County Society. The occasion was prompted by the retirement of Dr. Rothrock from active practice after some forty years devoted to his profession in Saint Paul.

The banquet was ably presided over by Dr. Arnold Schwyzer, and reminiscences and appreciation of the honor guest were expressed by Dr. O. W. Holcomb, president of the Ramsey County Society, Dr. John F. Fulton, Dr. J. T. Christison, and Dr. Henry Longstreet Taylor. Dr. J. C. Litzenberg, of Minneapolis, in behalf of the University, read a communication from the Board of Regents appointing Dr. Rothrock full Professor of Gynecology and Obstetrics at the University Medical School.

Dr. Rothrock responded with a brief sketch of the remarkable development of medical science which has taken place during his medical career.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

HOKAH WOMAN FOUND NOT GUILTY ON ABORTION CHARGE

State of Minnesota *vs.* Mae Jackson Mitchell

On Friday, December 11, 1931, after deliberating thirty-four hours, the jury in the District Court of Houston County returned a verdict of not guilty in the case of Mae Jackson Mitchell. The defendant was charged with having performed an abortion on a young married woman from La Crosse, Wisconsin, on or about May 16, 1931. The defendant is a woman about sixty years of age, residing in Houston County for the last twenty-five years. At the trial she testified that she was a practical nurse and a midwife. However, she holds no license to practice any form of healing in the State of Minnesota. Judge Karl Finkelnburg of Winona, Minnesota, who presided at the trial, informed the jury that he was very much disappointed with their verdict; that the evidence was amply conclusive to warrant finding the defendant guilty. At one time the jury stood nine for conviction to three for not guilty.

Judge Finkelnburg is to be commended for the public expression of the Court's opinion in this matter. The case was well and ably tried by Mr. W. E. Flynn, County Attorney of Houston County, Minnesota. Mr. Flynn and Sheriff Arthur C. Brown both are deserving of special thanks for the sincerity of their efforts in the preparation and trial of this case.

The State Board of Medical Examiners are determined to remedy a very bad situation that has existed in Houston County for some time and will take such steps in the future that conditions warrant irrespective of the outcome of this case.

UNLICENSED "SPECIALIST" DECIDES TO LEAVE STATE

"Dr." A. L. Collen, who claims to be from Chicago, and who has been operating in Winona County for the past thirty days, has informed Mr. E. D. Libera, County Attorney of Winona County, that he prefers to leave rather than face a prosecution for violation of the Basic Science Law. Collen claims to be a Doctor of Chemistry. He has been calling on farmers and other people in the vicinity of Winona selling them various preparations for stomach ailments, rheumatism and the like. When first interviewed Collen was very indignant over his being refused permission to operate in this State, his claim being that he was selling a medicinal preparation and could not be prosecuted for doing so. The evidence obtained by the State Board of Medical Examiners indicates that Collen has been holding himself out as a "Doctor" and a "specialist" from Chicago, furnishing preparations for the alleged relief of various ailments.

The Medical Board will appreciate hearing from anyone who has information indicating that Collen is still operating in this State.

THE COST OF PROPRIETARY AND NON-PROPRIETARY DRUGS

A comparison of the prices of drugs sold respectively under protected and non-protected names shows that the cost of the former is far in excess of the price for which the latter are sold. A comparison of the wholesale price of proprietaries compared with the cost of the drugs sold under their non-proprietary name shows that the total cost of one ounce each of these under a protected name is $25.30 while the cost of an ounce each under an unprotected name is but $6.40. The cost of the proprietary name to the consumer is $18.90. (Jour. A. M. A., October 24, 1931, p. 1226.)

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

They are getting together at last,—the doctors and the legionnaires.

One of the most important events of the year, from the standpoint of physicians and, we think, from the standpoint of veterans, too, was the conference called for Thursday, November 19, in Indianapolis between the committee appointed by the National Commander of the American Legion and the Legislative Committee of the American Medical Association.

These two committees conferred on new plans for care of veterans' disabilities. This care, according to the medical association committee, could be extended more promptly, more efficiently, less expensively—and without any dangerous dislocation of our economic system—through the medium of local civilian physicians and local civilian hospitals.

Four of the eleven men who sat around the Indianapolis Conference table were from Minnesota. They were C. B. Wright, Chairman of the Legislative Committee of the American Medical Association; E. A. Meyerding, State Secretary and a member of the same committee; Mr. Paul Fesler, President of the American Hospital Association and Superintendent of the University Hospital; and Patt Cliff of Ortonville, member of the Executive Committee of the American Legion.

These important conferences will continue at intervals throughout the year. Something of consequence, both to veterans and the medical profession, should develop.

Chairmen of Committees of the State Association should function for the President of the State Association very much as the cabinet functions for the President of the United States. An opportunity for this close advisory relationship is provided in the monthly Committee Chairmen's luncheon. The last meeting held at the University of Minnesota was given over mainly to discussion of the proposed modification of legislation for disabled veterans—this being the most important public question before the medical profession today.

C. B. WRIGHT (at this meeting): "We are accused of selfishness because we are 'trying to divert money now spent for care of veterans in government hospitals into the pockets of private physicians.' I welcome this charge of selfishness. We are not selfish for ourselves but for our profession. We are fighting, indeed, for the very life of the private practice of medicine. Not for ourselves, but for the men who shall come after us."

E. A. MEYERDING: "We shall have our best effect—not by sensational statements for the newspapers—but by individual and collective contacts with the veterans themselves. When the veterans understand our proposal they favor it. We cannot do better at this stage than to talk it over with the American Legion."

MR. PAUL FESLER: "The American Hospital Association has very carefully gone into this matter. There are approximately 1,200,000 beds in the hospitals of the United States at the present time and about 200,000 of them are vacant. The hospital association is prepared now to offer to the government approximately 76,000 first class beds in fully accredited institutions for the use of veteran patients."

"It has always been my contention," writes a distinguished member of the Medical Advisory Council to the Veterans' Bureau, "that government should not build and operate hospitals except to build the necessary additional facilities around existing medical organizations. This, incidentally, is the plan finally adopted by the Canadian government."

The Public Health Committee of the Ramsey County Medical Society presented an extremely important report at the November 30 meeting of the society. Every medical man could have listened with profit.

Obviously this committee has done a tremendous amount of careful research on the subject. Besides conveying a great deal of information, the report was characterized by eminently acute and intelligent interpretations of the general public health situation and its relation to the medical profession of today.

We take this occasion to congratulate the Ramsey County Public Health Committee. Any other medical group that inveigled the committee into repeating the report might consider itself lucky.

Have you noted the attractive series of public health lectures sponsored on three Sunday afternoons between December and March, by the Cleveland Academy of Medicine?

This group is the second in a series on the general subject, "Life in a Strenuous Age." This season's lectures include: "What Science Knows About Cancer," by Elliott C. Cutler, M.D., Western Reserve University; "Why Think About Eating?" by Henry Gerstenberger, M.D., Western Reserve University; and "Fighting Death After Forty," by R. W. Scott, M.D., Western Reserve University and Chief of the Medical Division, City Hospital, Cleveland.

These lectures are made possible through a gift to the Health Education Foundation of the Academy.

The United States Public Health Service comes in for suspicion and distrust now and then on the part of the foes of State Medicine. The following excerpts from an official bulletin of the service prepared by A. J. McLaughlin, M.D., Medical Director of the service, are particularly impressive and important, therefore.

Every practising physician should read this pamphlet entitled "The Medical Profession and the Health Department." It can be had for five cents from the United States Government printing office at Washington, D. C.

> "We speak of the organized medical profession," says Dr. McLaughlin, in this pamphlet. "But its organization is little more than provision for periodic meetings for the reading and discussion of papers on scientific subjects. An exaggerated sense of ethics makes many physicians shrink from anything like business organization; yet organization on a business basis, provision for clinic facilities, regulation of fees on a sliding scale basis according to income are absolutely essential if State Medicine is to be prevented."
>
> Again, "I should like to see the medical profession solve its own problem in its own way without outside interference by governmental or any other agencies. Proper organization of county medical societies will make State Medicine impossible, enable the physician to retain his self-respect and preserve that priceless, intimate, confidential relation that should exist between physician and patient."

Could anything in the way of a warning be more direct and forthright? Could it come from a more responsible, a better informed, a more impressive source? Surely in America there is neither official pressure nor economic necessity for any such drastic dislocation as State Medicine. American medical reforms are, indeed, "up to" the County Medical Society.

A GOVERNOR LOOKS AT CHIROPRACTIC

Governor Buck of Delaware has returned to the legislature, without his approval, a bill to create a board of chiropractic examiners and to regulate the practice of chiropractic. His summarization of the reasons for his veto is so clear and terse that it should be read by the legislators and governors of every state that is threatened or already afflicted with this cult. His statement follows:

> The purpose of the act, as I understand it, is to legalize the practice of chiropractic in this state. Practitioners of this cult are not recognized now. Do they profess to be doctors in the same sense of the term as is commonly understood to apply to men and women of the medical profession? Insofar as I am able to determine, there is not a recognized medical school in the country that includes in its curriculum a course in chiropractic. This fact in itself seems singularly significant.
>
> Even to the lay mind the idea that all disease of whatever character is due to spinal displacements of a mild sort, and that cures of such ailments as tuberculosis, smallpox, diphtheria, scarlet fever and others can be effected by manipulation and fingering of the spine is preposterous.
>
> Before returning this bill to you I have satisfied myself that the training and education a chiropractor, or drugless healer, needs to practice his art does not fit him properly to advisedly treat the sick, inasmuch as he is not qualified to diagnose ailments nor recognize communicable diseases and to take measures to control them. He is, therefore, an opponent to the department of health.
>
> Wherefore, it seems to me it would be inconsistent for the legislature to appropriate, as it will do, money for the state board of health, which board is trying to eradicate communicable disease, and at the same time legalize the practice of a cult which does not believe in the germ theory of a disease but does teach and believe that such diseases as scarlet fever, etc., are due to a distracted vertebra and the method to prevent and cure such disease is to see that everybody has a normal spine.—*Journal A. M. A.*

FOODS AND FOOD ADVERTISING

Today, advertising of foods, separate from the package container, is not controlled by any food statutes, and indeed is quite free of any efficient control. The writer of advertising of food products, aside from such limited knowledge of foods and nutrition as he may possess, has only a versatile vocabulary and his conscience as guides in dramatizing the virtues of the products he proclaims to the public. Under these conditions, advertising for food products began to approach the tales of Hans Christian Andersen and the brothers Grimm. Into this mass of mingled truth and deception entered the Committee on Foods of the American Medical Association. It is not surprising that its initial steps should have been greeted with apprehension and bitter deprecation by some of the organs of the food industry, of business and of advertising. The Committee on Foods was established to protect the readers of the journals published by the American Medical Association against improper claims made for foods. If the medical profession required such protection, how much more was the protection necessary for the average layman, to whom the same claims were made as were made to physicians. Only those who have been actively associated with the Committee on Foods can realize the vast amount of good already accomplished. (Jour. A. M. A., October 3, 1931, p. 1004.)

MISCELLANEOUS

THE GENESIS OF SOCIAL INSURANCE

Edward H. Ochsner, M.D.
Chicago

(The following article is one of several which will appear simultaneously in other state journals dealing with various phases of Social Insurance. In view of the growth of the idea of governmental responsibility for the medical and economic care of its citizens, the subject is one of prime importance to the American public at large as well as to the medical profession.)

Social Insurance is the hybrid offspring of impracticable sentimentalism and political expediency. It is an epidemic disease first observed in Germany about fifty years ago which has gradually spread and infected a considerable number of the nations of the earth and now has arrived at our very doors. Unless we succeed in establishing a rigorous quarantine of enlightened public opinion, it will surely gain a foothold in this country in the not distant future.

Social Insurance consists of the following subdivisions or parts: Compulsory health insurance, old age pensions, widows' and orphans' pensions, and unemployment pensions or doles. In none of the countries were 'they all adopted at the same time. Germany adopted compulsory health insurance in 1883, and all of the other forms since that time. Austria adopted compulsory health insurance in 1888; Hunary, in 1891. England adopted old age pensions first and compulsory health insurance in 1911, and the others subsequently. In this country some of the states have adopted old age pensions and some widows' and orphans' pensions, but so far none have adopted compulsory health insurance, for which negative blessing let us raise our voices in thanksgiving.

When the scientific physician is confronted with the problems presented by a new patient, he meets the situation in the following manner: he obtains a complete family and personal history in order to ascertain if possible the causes which have brought about the condition; by his physical examination and laboratory investigations he finds out what variations from the normal have taken place; after all this he is in a position to advise and institute the proper treatment. Let us follow the same course in the study of this problem.

During the late seventies a number of German parlor socialists conceived the idea that the state make itself responsible for the medical care of its workers. The sentiment in favor of compulsory health insurance grew rapidly among the workers, and Bismarck, although expressing serious doubts as to the soundness of such a measure, yet feeling that something had to be done in order to appease the clamor of the proletariat and the alarming growth of socialism, adopted social insurance as a government measure, had a bill drafted and enacted into law.

In England, National Insurance, as it is called there, had a slightly different setting but substantially the same background. In 1910, David Lloyd George in order to strengthen himself politically decided the time for such legislation was opportune. Not being able to speak German, he gathered about himself several interpreters, hied himself to Germany and after interviewing the well paid heads of the German system, and after having been wined and dined and lionized for two weeks or so, he returned to England very enthusiastic about the whole project, had a law drafted, and later secured its passage. In the recent parliamentary election the Liberty party, of which Lloyd George has been the head for many years, elected just four members to Parliament or less than one per cent of the whole number. So while Lloyd George may have saved his political skin by National Insurance in 1911, he certainly lost his hide by it in 1931.

Practically every reform movement attracts to itself a considerable number of well meaning, emotionally impressionable, impractical, irresponsible, very vociferous individuals, and very often a group, usually the very ones who manage the propaganda and who hope to gain some pecuniary benefit from it. Social Insurance is no exception to this general rule.

Some of the common characteristics of reformers is that they want a new law passed for every human ill, and when the law is enacted they either sit back waiting for the millennium to arrive or they rush off looking for new evils to correct by new laws, forgetting to see to it that the law just passed is being properly enforced, and forgetting at all times that all laws must depend for their enforcement, not upon supermen, but upon men often of less than average intelligence and integrity, upon politicians and their henchmen, who are quick to see how these usually unsound and loosely drawn laws can be converted to their own advantage.

(The foregoing is what is actually happening in some of the countries where such laws are in operation, as future installments will show.)

LISTERINE, AN EXAMPLE OF BOTTLED PSYCHOTHERAPY

The odor and taste of thymol with a little of this and that. The formula given on the carton, "Thyme, eucalyptus, baptesia, gaultheria and mentha, of each one part, boric and benzoic acids, twenty-nine parts, ethyl alcohol, two hundred and fifty parts, water to make one thousand parts. Lambert Pharmacal Company," is merely "a formula." The A. M. A. Laboratory found that the following gives a solution practically identical (chemically and bacteriologically) with Listerine: Boric acid 23.4 Gm., benzoic acid 0.4 Gm., alcohol (94%) 280.0 c.c., menthol 0.375 Gm., thymol 0.75 Gm., eucalyptol 0.8 c.c., methyl salicylate 0.1 c.c., baptesia (wild indigo) fluidextract N. F. 10.0 c.c., water to make 1000.0 c.c. What progressive physician would attempt to write such a polypharmaceutical prescription! (Jour. A. M. A., November 14, 1931, p. 1466.)

OBITUARY

Dr. Frank Lee Puffer

1853-1931

The death of Dr. F. L. Puffer of Bird Island occurred in May, 1931. Born in 1853 and receiving his degree from New York Medical College in 1877, he began practice in Beaver Falls in 1878. He was preceded by just two other doctors in Renville County, namey, Dr. H. Schoregge, who came to Henryville in 1870 and Dr. C. S. Knapp who began practice in Cairo in 1871.

To quote from an editorial which appeared in the Olivia Times:

"Dr. Puffer was a true physician, with a proper conception and estimation of the real character of his profession. His doctrine was one of helpfulness to others, and his practice was to give freely of his service to those in need of it regardless of the consequences to him. In speaking at a Kiwanis club luncheon in Olivia about a year ago, Dr. Puffer related some of his most thrilling experiences in early days in this county. On the evening of October 15, 1880, he was called to see a sick patient seventeen miles from Bird Island. After a long ride over the bleak prairie he reached his destination, but shortly afterwards a storm set in, blocking all roads and making travel uncertain and almost impossible. He stayed several days at his patient's home, then started to shovel his way back to town. On the return he made a detour to see another patient, shoveling his way to this home, and from there to Bird Island, and finally reached home on October 22, just one week from the day he started out on the call. This was only one of the many such experiences he related, and during his brief talk his audience had a picture of devotion to duty brought before their minds, of a lone figure making its way across the bleak prairies of Renville county in 1880, pressing on and on, with great bodily suffering and discomfort, but with a devotion to duty that challenged the admiration of all his hearers.

"The passing of those good, old pioneers gives occasion for profound sadness and regret. They were so human, so self-sacrificing and their lives so in keeping with the best aspirations of the human heart, that we feel their loss most keenly. On the other hand, the opportunity for service came to them as it comes nowadays to very few, and in passing they leave to us a record of service, a lesson of devotion to duty, worthy of the pioneers and of lasting benefit to future generations."

Hugh Spaulding Willson

1877-1931

Word has been received of the death in La Jolla, Calif., of Dr. Hugh Spaulding Willson, fifty-five years old, who practiced medicine in Minneapolis from 1913 to 1926 as a member of the firm of Willson, Cabot and Wohlrabe.

Dr. Willson was born in North Dakota in 1877. He was graduated from the school of medicine of the University of Minnesota in 1904. In the World War he served overseas as commanding officer of base hospital number 70. Following his graduation from the University of Minnesota he was connected with the staff of the Mayo Clinic in Rochester for several years. He specialized in internal medicine.

Dr. Willson is survived by his wife, Mary, and his father, who lives in North Dakota.

H. J. Rowe

1848-1931

Dr. H. J. Rowe died Friday, November 20, 1931, at his home in Minneapolis.

Dr. Rowe had been a resident of Minneapolis four years. For many years he was secretary of the North Dakota State Medical Association, and was a grand officer of the North Dakota Odd Fellows and prominent in Masonic work.

Surviving are his wife and two sons, Dr. Paul Rowe of Minot, N. D., and Dr. Arthur Rowe of New York.

Robert H. Harrison

1862-1931

Dr. Robert H. Harrison, Saint Paul, in charge of the government serum plant at South Saint Paul, and for thirty years a resident of Saint Paul, died at his home Sunday, December 13, 1931, after ten weeks' illness.

Dr. Harrison, both a doctor of medicine and a veterinary surgeon, helped to found the veterinary department at Harvard as a young man. Born in New York, March 9, 1862, he attended New York Medical College, and Harvard. In 1898 he entered the government service and since had been stationed at Milwaukee, Eau Claire and South Saint Paul.

His widow and a son, George, of St. Paul, and two sisters, Mrs. Albertine J. Williams of Philadelphia, and Miss Lucie R. Harrison, living in England, survive.

THEELIN

And the Technic of Introduction of New Drugs.—For many years the Council on Pharmacy and Chemistry has fostered certain broad principles governing the introduction of drugs. Often after a drug has shown promise of considerable merit it has been introduced through wrong channels or by misdirected publicity. To safeguard the scientific integrity and academic interests of the Doisy discovery of the crystalline sex hormone, the St. Louis University School of Medicine devised a plan on the basis of precedent which may serve as a guide to others in the introduction of a new medicament. Irrespective of whether or not theelin is found valuable for medical practice, Dr. Doisy and St. Louis University are to be congratulated on taking such precautionary steps, thus placing the introduction and control of the remedy on a high plane. (Jour. A. M. A., November 21, 1931, p. 1541.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The programs for the month of January will be as follows:

January 6—Personal Hygiene—Physical Activity.
January 13—Causes of Bad Breath.
January 20—Three Score and Ten Approaches.
January 27—Warning Signs of Cancer.

STATE CONFERENCE OF SECRETARIES

Three major discussions will occupy convening secretaries and a large number of out-of-state visitors at the annual Secretaries Conference of the Minnesota State Medical Association to be held Saturday, January 23, at the Saint Paul Hotel.

A symposium on the general subject, "Medical Care of the Poor," will occupy the major part of the morning session. The luncheon meeting will be devoted to a series of talks on the subject, veterans' legislation and contemplated reforms. A symposium on the periodic medical examination will follow in the afternoon.

Mr. H. Van Y. Caldwell, Secretary of the Cleveland Academy of Medicine, is among the important out-of-state speakers who are coming to St. Paul especially to address this conference. Many others who will attend the Northwest Regional Conference on the Sunday following the Secretaries' Conference will also come in time to speak at both meetings. Among them are Mr. Vernon D. Blank, Des Moines, General Manager of the Iowa State Medical Society; Mr. Theodore Wiprud, Milwaukee, Executive Secretary of the Medical Society of the County of Milwaukee; H. M. Camp, M.D., Executive Secretary of the Illinois State Medical Society; Mr. T. A. Hendricks, Executive Secretary of the Indiana State Medical Society; Dr. Otto Fcidler, President of the Wisconsin State Medical Association; Mr. George B. Larsen, Secretary of the Polk County Medical Society, Frederic, Wisconsin.

REGIONAL CONFERENCE

The regional conference composed of officers of state medical societies of the Northwest resumed its annual informal conferences last year, after a lapse of several years. Its 1932 program for discussion includes Social Medicine, Contract Practice, The Shoulders Resolution Auxiliary Committee, Lay Education, State Medical Journals, and the Periodic Medical Examination. The states participating in this conference include Minnesota, Wisconsin, Iowa, North and South Dakota, Nebraska and Montana.

FRACTURE SYMPOSIUM

On February 3 and 4, 1932, there will occur in Minneapolis a discussion of the modern treatment of fractures. This is being conducted under the joint auspices of the Minneapolis Regional Sub-Committee of the General Fractures of the American College of Surgeons and the Minneapolis Surgical Society.

On Wednesday evening, February 3, 8 o'clock in the Auditorium of the Hennepin County Medical Society a symposium on the treatment of fractures will be held.

The program on Thursday, February 4, will be entirely under the direction of the Minneapolis Surgical Society in connection with its annual formal meeting. Dr. Kellogg Speed of Chicago, an outstanding authority on the subject of fractures, will be the guest speaker. At 10 o'clock, Thursday morning, Dr. Speed will conduct a fracture clinic with demonstration of cases at the Minneapolis General Hospital. At 3 P. M. he will lecture to the students of the medical school, and following the annual formal banquet of the society in the Nicollet Hotel at 6 P. M. he will deliver an address before the society.

All members of the profession in good standing are invited to attend these meetings, including the banquet.

Reservations for the banquet must be made with the secretary, H. O. McPheeters, At. 5579, before Wednesday noon, February 3, 1932. Banquet tickets are $2.00.

STATE MEDICAL AND HOSPITALS ASSOCIATIONS

For the first time in their history, the Minnesota State Medical Association and the Minnesota State Hospital Association will hold their annual meetings at the same time and under the same roof this year.

The sessions will begin May 23 at the new St. Paul Auditorium and continue through May 25.

This much was definitely decided upon at the first meeting of the Committee on Scientific Assembly December 5, to which officials of the state hospital body were invited.

Ample lecture and clinic rooms for both organizations are available in the new building, now close to completion. Exhibits for both organizations will be assembled in the large new exhibit room of the building. One large general meeting is being arranged tentatively for Monday night, May 23, which will unite both organizations and the Women's Auxiliary to the Medical body. The subject on this occasion will probably be "Veterans Legislation."

Another new feature of the tentative meeting schedule should be of particular interest to Twin City physicians. For the convenience of the latter, all distinguished out-of-state speakers, of whom four or five are now under discussion, will be booked to talk at noonday sessions.

Arrangement of the scientific program by small sections instead of large general sessions is also under consideration by the committee. If present plans materialize there will be fifteen different sessions in the three day program. Only a few of the these, including the noonday sessions, will be general meetings.

The afternoon of the 25th will be devoted exclusively to clinics if present plans of the committee are carried out. If possible, these clinics will be held at the Auditorium itself, where ample room is available, thus avoiding the inconvenience of moving the meeting to the University or the hospitals.

Final selection of speakers and subjects will be determined largely by responses to the questionnaire already sent out to all members of the association.

CHAIRMEN OF COMMITTEES MEETING

A complete report of the results accomplished in the recent meeting of committees from the American Medical Association and the American Legion in Indianapolis chiefly occupied the chairmen of committees of the State Association at their last regular meeting, held at the Minnesota Union at the University, Monday, November 28.

C. B. Wright of Minneapolis, chairman of the Legislative Committee of the American Medical Association, and E. A. Meyerding, St. Paul, Executive Secretary and member of the Auxiliary Committee on Veterans' Affairs, both of whom attended the Indianapolis meeting, spoke.

Mr. Paul Fesler, superintendent of the University Hospital and President of the American Hospital Association, and A. Calvin, Superintendent of Midway Hospital in Saint Paul, were present by invitation to explain the hospital men's attitude on the subject.

A brief report by J. A. Watson, Minneapolis, chairman of the Committee to Coöperate with the Minnesota Editorial Association, on the last meeting of his committee with the editors concluded the program, which ended as agreed upon at 2:00 o'clock promptly.

The next chairmen's meeting was set to coincide with the Secretaries' Conference, January 23, in Saint Paul.

CAMP RELEASE DISTRICT SOCIETY

The annual meeting of the Camp Release District Medical Society was held at Granite Falls, Minnesota, Monday afternoon and evening, November 30, 1931.

Following the business session in the afternoon a Skin Clinic was held under the direction of Dr. W. H. Goeckerman of the Mayo Clinic. Dr. Goeckerman addressed the members on the subject "Eczema and Urticaria."

At 6:30 o'clock a joint dinner with the District Auxiliary was held at the Riverside Hotel. Following the dinner short addresses were given by Dr. L. Sogge, president of the State Medical Association, Windom, Dr. H. M. Workman, District Councilor, Tracy, Minnesota, and Mrs. James Blake, president of the State Auxiliary, Hopkins.

The evening's program consisted of two addresses. Dr. Lewis Jordan, Granite Falls, spoke on "Tuberculosis" with demonstrations of the Mantoux test. Dr. Willard White of Minneapolis spoke on "Some Problems in Treatment of Fractures."

The following officers were elected for the ensuing year: F. W. Penhall, Morton, president; G. H. Mesker, Olivia, vice-president; J. Dordal, Sacred Heart, secretary-treasurer; L. J. Holmberg, Canby, delegate to annual meeting, with M. A. Burns of Milan as alternate.

RICE COUNTY SOCIETY

The annual meeting of the Rice County Medical Society was held in the Faribault Clinic Rooms on Tuesday, November 10, 1931, at 7:45 p. m.

Dr. W. E. Wilson, Northfield, read a paper entitled "A Review of a Poliomyelitis Epidemic." Dr. E. C. Rosenow, Rochester, spoke on "Bacteriologic and Immunologic Studies of Poliomyelitis."

Election of officers for 1932 resulted as follows: President, Dr. J. M. Murdoch, Faribault; vice president, Dr. W. E. Wilson, Northfield; second vice president, Dr. Edmund Backe, Kenyon; secretary-treasurer, Dr. C. J. Plonske, Faribault; delegate to State Meeting, Dr. A. M. Hanson, Faribault; Censors, Dr. F. M. Babcock, Northfield, Drs. M. L. Mayland and S. B. Hessaly, Faribault; Publicity Committee, Drs. F. U. Davis and P. A. Smith, Faribault; Dr. O. P. Thorson, Northfield.

WRIGHT COUNTY SOCIETY

The annual meeting of the Wright County Medical Society was held at Buffalo, Minn., Tuesday, October 6, 1931.

Minutes of the Delano meeting were read and accepted.

A paper on "Diabetes Mellitus" was read by Dr. C. L. Roholt. Dr. E. Klaveness read a paper on "Medical Ethics." Dr. Klaveness' ideas were clearly set forth both from the standpoint of personal opinion and from experience. He is to be congratulated on his courageous expression on such a delicate and unpleasant subject when handled locally.

Election of officers for 1932 resulted as follows: Dr. F. Ellison, Monticello, president; C. L. Roholt, Waverly, vice president; J. J. Catlin, Buffalo, secretary; Oscar Freed, Cokato, delegate to State Meeting; E. Klaveness, Saint Paul, alternate; George Nonis, Annadale, censor for three years.

The Ladies' Auxiliary were entertained by Mrs. J. J. Catlin.

Drs. C. B. Wright and N. Pearce, of Minneapolis, gave a talk on the Various Aspects of Medical Economics, a very interesting and a most timely subject worthy of serious consideration.

C. L. Roholt, *Secretary.*

WOMEN'S AUXILIARY
Minnesota State Medical Association

CAMP RELEASE AUXILIARY

The annual business meeting and election of officers of the Women's Auxiliary to Camp Release Medical Society was held at Granite Falls, Monday afternoon, November 30. Mrs. J. S. Kilbride, retiring president, presided at the session. New officers elected are: President, Mrs. R. C. Adams, Bird Island; first vice president, Mrs. J. Dordal, Sacred Heart; second vice president, Mrs. M. A. Burns, Milan; secretary, Mrs. G. H. Mesker, Olivia; treasurer, Mrs. M. S. Nelson, Granite Falls.

Mrs. James Blake, of Hopkins, state president, gave a splendid address on the work of the Auxiliary at the afternoon session.

At 6:30 a joint dinner with the members of the medical society was given at the Keegan hotel. The dinner program included talks by Dr. L. Sogge, Windom, state president of the medical society; Dr. H. M. Workman, Tracy, district councilor; and Mrs. James Blake, state president. A rising vote of thanks was given Mrs. Blake for her inspirational address.

HENNEPIN COUNTY AUXILIARY

The Christmas party of the Woman's Auxiliary to the Hennepin County Medical Society was held on Wednesday, December 16, in the room of the Hennepin County Medical Society. "The Lonesome Christmas Tree" was the subject of a reading by Mrs. E. Z. Wanous. The program, which was arranged by Mrs. C. E. Proshek, included the singing of Christmas carols by a group of Slavic children and Christmas songs by the children from St. Mary's Russian church.

MOWER COUNTY AUXILIARY

The auxiliary of the Mower County Medical Association held an open session Monday, November 30, at the Y. W. C. A. rooms. About fifty women were present. Besides the members who are the wives of Mower County doctors, the presidents of the Parent-Teacher Association were present.

The president, Mrs. A. W. Allen, presided. In an informal way, she told how the organization was formed last April with the following officers, besides herself: Vice president, Mrs. M. W. Morse of Le Roy; secretary, Mrs. P. A. Lommen; and treasurer, Mrs. G. E. Hertel. Five meetings had been held. The work taken up was sewing for the local hospital.

Mrs. Allen then turned the program over to Mrs. C. C. Allen, who for some time has been especially interested in health work. Aside from musical numbers, the program consisted of reports from the Regional Conference of Health and Social Work which was held at Kasson, November 6. Mesdames A. W. Allen, C. C. Allen, C. L. Sheedy and B. J. Cronwell, were present at that meeting.

RAMSEY COUNTY AUXILIARY

The auxiliary to Ramsey County Medical Society met Monday, December 7. The auxiliary had offered a silver cup to the Saint Paul High School student submitting the best essay on the Christmas seal week.

STATE AUXILIARY

Seventy-five essays on "Today's Fight Against Tuberculosis" were received and the ten best were broadcast over Radio Station WCCO. The woman's auxiliary to the State Medical Society had donated two cups to be given to the two best essayists.

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of November 5, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held in the Lounge on the 20th floor of the Medical Arts Building on Thursday evening, November 5, 1931.

The meeting was called to order at 8 p. m. by the President, Dr. J. Frank Corbett. There were 27 members and 5 visitors present.

The following scientific program was presented.

Dr. A. F. Bratrud reported a case of Lipoma at the Ileocecal Valve Causing Intestinal Obstruction, as follows:

The case presented this evening is that of a woman 67 years of age who was first seen and examined on April 6, 1931. She had been in very good health up to about five years ago, at which time she had some form of operation for removal of a brain cyst. She had pneumonia at 45 years of age and normal menopause at 48 years of age. The family history was negative.

Her present complaint dated back to about October, 1930, at which time she first noticed sharp cramps in the right side of the abdomen, with radiation of pain across the abdomen. She states that it felt as if there was a growth in the abdomen. There had been a gradually increasing weakness, with 20 pounds loss of weight since October 1, 1930. She complained of difficulty in keeping the bowels open. There would be a day or two, at intervals, when the bowels would be rather loose. She has had distention of the abdomen with belching of gas, but no nausea or vomiting. There had been palpitation of the heart at times, and during the previous week she had had dizziness. The dizziness occurred either while lying down or while up and around.

Examination showed a fairly well-nourished and fairy well-developed woman about 67 or 68 years of age. Blood pressure 140/68; temperature 98°; pulse 74. The skin appears as though the patient had lost some weight. There is an area about 1.5 inches in diameter in the mid-parietal region of the cranium where bone has been removed. She had had an occasional cough which is noticeable when she is lying in bed and which seems to cause some distress. The mouth, ears, nose and neck are normal. There is no adenopathy. The heart is enlarged to the left to the anterior axillary line. There is a systolic murmur heard at the apex ending at the second sound. The breath sounds of the right chest are normal. There is bronchovesicular breathing in the left chest. Slight distention of the abdomen is noticed. There is tenderness and spasm in the right lower quadrant of the abdomen with the suggestion of a mass close to the crest of the ileum. This is not movable. Percussion at the costal margin is negative. Rovsing's sign is negative. Pelvic examination is negative. The reflexes are normal. The urine shows a specific gravity of 1.021, with a trace of albumin, no sugar, and numerous pus cells. The phenolsulphonephthalein test showed a return of 32.5 per cent in two hours. The blood chemistry showed sugar 0.108; urea nitrogen 19.6 mgms. White blood count was 7,200; differential—pmns. 74, lymphos. 21, eos. 4. The hemoglobin on April 8, 1931, was 92 per cent; on May 11, 1931, was 77 per cent.

Electrocardiogram—P-wave broad and flat; R-wave slurred, descent gradual. The tracing does not look exactly normal, but there are no definite changes that would contraindicate operation.

A series of plates and fluoroscopic examination made immediately after a barium meal showed the stomach normal in size, shape and position. There is no deformity of the walls of the stomach and the cap is clean-cut and not deformed. Examination at 6 hours shows the entire meal in the lower ileum.

A barium enema was administered under fluoroscopic control and plates were made. These show a moderate spasm involving the entire colon. There is a localized filling defect of the lower portion of the cecum with a moderate degree of spasm involving the ascending colon. Conclusion: Normal stomach and cap; I believe the findings in the cecum represent a carcinoma.

On April 13, 1931, under spinal anesthesia, a right rectus incision was made in the lower abdomen. There was an indurated nodular mass involving the head of the cecum and about the ileocecal valve, the mass being about the size of a fist. There was an indurated area retrocecal to the cecum ascending up about 4 inches. The cecum was adherent to the right broad ligament. The pelvis was negative; liver negative. A resection and aseptic anastomosis, end-to-side, of the terminal ileum with the transverse colon, was performed. Inversion of the terminal portion of the ileum was performed, leaving the stump of the distal ileum with the cecum still within the abdominal cavity. Closure was made in layers without drainage. The postoperative course was uneventful.

On April 28, 1931, under spinal anesthesia, the old scar was excised, extending the right rectus incision to above the umbilicus. The mass at the head of the cecum was much smaller, being about the size of a medium sized orange. There were no glands posterior to the cecum. There were very few adhesions following the operation two weeks previously. Resection of the cecum, terminal ileum and including the ascending colon and hepatic flexure of the colon was performed. The stump of the transverse colon was inverted and final closure was made with linen with peritonealization of all surfaces. The closure was made in layers without drainage.

Report on specimen removed: Cecum widely resected. The walls are very thick with a tissue closely resembling fat. Walls are an inch thick in places. The lumen of the intestine is small and the mucous membrane fairly regular and smooth. The tissue causing the thickening and obstruction originates from the outer coats of the intestine. There is narrowing and obstruction present.

Section: Great deal of fatty and fibrous tissue. Considerable round cell infiltration of the muscle layers of the intestine. The glands appear normal in size and shape. There is a great number of eosinophiles between the columns of the glands. There is no evidence of malignancy.

The pre-operative treatment in this case consisted principally in high caloric diet with digitalization and sedatives. Ergot was given pre- as well as post-operatively. The post-operative course was uneventful. She was discharged from the hospital on May 17, 1931, with the wound well healed and feeling well. She was last seen and examined on September 5, 1931, feeling extremely well and back to normal weight. At that time she was eating practically all foods and having practically no intestinal disturbance at all.

Comments: It was impossible to determine at the time of operation whether this was a benign or a malignant condition from the appearance of the tumor. On account of the rarity of this type of tumor, it was not even suspected. The origin of this tumor, according to Ewing, is different from that of those reported. This growth arose apparently from the outer coat of the intestine, whereas they usually arise from the submucosa or from appendices epiploicæ of the colon. It is believed that this type of tumor causes more pain or cramps than a malignant condition on account of the location of the tumor. Even with the high hemoglobin, the true nature of the tumor was not suspected.

DISCUSSION

Dr. E. T. Bell (by invitation) stated that he had seen several benign tumors in that location but had never come in contact with a lipoma at that place. The benign tumors of the intestinal tract are rather rare compared with the malignant ones, the more common ones being myomata and benign glandular polyps. But the lipoma is a distinctly rare form of tumor in the intestinal tract. He said that nothing in particular is known about the cause of these tumors.

Dr. J. F. Corbett asked as to the size of this tumor and also whether it was annular.

Dr. Bratrud said that originally the tumor was about the size of a man's fist, but at the time of the second operation it was only about one-half that size. The ileocecal valve even at the second operation seemed to be practically closed.

Dr. McPheeters asked if it felt like carcinoma.

Dr. Bratrud replied that it was impossible to determine what type of tumor it was from the gross appearance. He did not think that it really felt as firm and nodular as a carcinoma in this location should feel. The one thing that made him doubtful about this being a carcinoma was the fact that there were no glands retrocecally.

Dr. Willard C. Peterson read his Inaugural Thesis on "Chronic Recurrent Appendicitis."

ABSTRACT

The object of the study is to determine whether there are any characteristic structural changes in the appendix in the so-called chronic appendicitis. The material consists of 100 cases of chronic appendicitis which have been thoroughly studied clinically. Each appendix was sectioned in three places. The author gave a review of the clinical phenomena, the differential diagnosis, pathology and a review of the literature. The classification of the lesions found in this series he made as follows:

1. Clear-cut type of chronic inflammation.
2. Chronic periappendicitis.
3. Patent appendix.
4. Obliterative appendix.
5. Carcinoma, cysts, anomalies, and tuberculosis.
6. Normal.

The author also gave a review of the treatment and post-operative results.

Dr. Kenneth Bulkley gave a lantern slide talk showing the lesions caused in the appendix by parasites—oxyuris vermicularis and trichocephalis dispar—as a possible etiologic factor in appendicitis.

Dr. Bulkley thought that possibly it was unfortunate both for surgeons and for the public that there is so much appendicitis; its very frequency tended to make both groups of individuals belittle its importance. He felt that Dr. Peterson's paper was worth while inasmuch as any study which contributed toward our knowledge of the etiology of this disease was of value. In the last analysis, no one knows anything in regard to the etiology of appendicitis or its prevention except that it seems to be an established fact that a break in the mucosa is probably essential for the development of appendicitis. The only absolute prevention of appendicitis is to remove the normal appendix prior to the onset either of inflammation in it or prior to the onset of symptoms from it. In this connection Dr. Bulkley cited an experience which he had some eighteen years ago in which he assisted a prominent New York surgeon, now dead, in removing four normal appendices from his four normal children who never had had symptoms of appendicitis, these operations being done because of an unfortunate experience with his fifth child who had developed a gangrenous appendix during his absence.

In connection with the etiology of appendicitis, Dr. Bulkley wished to call the attention of the members to the role possibly played by parasites in causing not only definite breaks in the mucosa of the appendix but definite lesions in the wall of the appendix. The parasites most commony at fault were the oxyuris vermicularis or pin-worm or seat-worm and the trichocephalis-dispar or whip-worm. Dr. Bulkley then demonstrated by means of some twenty lantern pictures, a series of microscopic slides showing the lesions caused by both of these parasites from their early penetration through the columnar epithelioma to their eventual death and hyalinization through fibrous encapsulation by the host. Dr. Bulkley called attention to the fact that this subject was largely overlooked chiefly because of the lack of proper technic in the search for these parasites. He called attention to the fact that if their percentage incidence was to be correctly estimated, not only was it necessary to examine microscopically the contents of the appendix but that it often was necessary to make large numbers of serial sections of the appendix walls; that it was only by so doing that he and Dr. R. L. Cecil, with whom this work was originally done some eighteen years ago, had been able to find the lesions demonstrated to the Society tonight.

DISCUSSION (on thesis and lantern slides)

Dr. E. T. Bell (by invitation) stated that this form of appendicitis is the only kind which pathologists recognize as chronic appendicitis, and it is chronic in the sense of recurrent acute attacks. As Dr. Peterson pointed out, this is clinically the same as ordinary appendicitis except that the attack is more mild. But there are all degrees of intensity of attacks. Some of these patients have had eight attacks over a period of years. The intense symptoms last several days, then soreness and tenderness continue for possibly several weeks. So far as Dr. Bell had noticed, these are the only kind of attacks these patients have—fairly mild attacks—and he had never seen any which went over into the gangrenous form. He stated that there is nothing known to pathologists as chronic appendicitis in the sense that syphilis or tuberculosis is chronic, but these are just a series of mild acute attacks.

When one operates, the appendix looks normal unless microscopic sections are cut, and for this reason sometimes the surgeon is much embarrassed because he may think he has operated on a normal appendix. But a microscopic section brings out quite clearly an inflammation in the serous layer of the appendix. The typical acute appendicitis starts from the mucosa; then the inflammation spreads out to the serosa. If one could get these cases in the first few hours of the attack it would be possible to find the primary mucosal lesion; but after a day or so it has spread to the whole appendix, the extension to the muscularis and mucosa being secondary. The inflammation is characterized by lymphocytes. It is not an acute process in which one finds polymorphonuclears. It is only on microscopic section that this is shown. In a great many of the cases in which the surgeon may think the appendix is normal, it really is not. Dr. Bell said it is not known whether the appendix is responsible for the symptoms in cases in which it is normal microscopically.

Then there is the obliterated appendix which is found in some cases, in which there is no lumen in the appendix. He could not feel that that type of appendix could possibly cause symptoms. This latter type of appendix increases in frequency with age; the older the patient is, the more likely is he to have an obliterated appendix.

Then there is the question of fecaliths, which may cause cramps. But a great many of these fecaliths are found in the appendix postmortem in patients who have never had symptoms.

Another form is the type with adhesions about the appendix. Young children have practically no adhesions at this point, but in each decade more and more of them are found, and they are seen in more than half the middle-aged. These are often seen postmortem, and it is difficult to believe that these adhesions are the cause of the symptoms. They might be, but evidence is against it.

Then there is a benign tumor of the appendix which is commonly called carcinoma, but since it is not malignant a better term is "carcinoid." Microscopically it looks malignant but it isn't. It forms a hard button at the end of the appendix but never gets outside the organ. It causes inflammation.

Dr. Bell stated that this chronic appendicitis is a well-defined type of appendicitis in which the appendix looks normal but on microscopic sections one finds inflammation in the serosa.

He was also of the opinion that people who have indefinite abdominal complaints very seldom have appendicitis and the follow-up usually shows they have some other disease. He had seen several cases of renal stone giving the same symptoms, and to cover all these up with the name of "chronic appendicitis" is not helping the surgeon. Dr. Bell said he did not want the members to think he was taking the attitude of criticizing the surgeons for taking out an appendix when they have a clinical picture of appendicitis, for if the surgeon is too conservative he may lose a patient who has a gangrenous appendix. He did want to say that when an appendix is removed and found to be normal histologically, the patient should be thoroughly studied to see if a similar error might be avoided in the future.

He also called attention to the term, very common in French literature, of "perityphlitis," in which there is inflammation around the cecum and appendix, but he had not seen infections of that type. While he had seen quite a lot of inflammation which had spread around the cecum it seemed to be definitely traceable to the appendix.

Then of course there are the parasites in the appendix which may be the cause of appendicitis. The most common of these are the pin worms and thread worms.

Dr. Bell stated that these were very amazing pictures which Dr. Bulkley has shown and while he had had a general idea that worms were the cause of some appendicitis he had seen only two or three such instances. However, he had not studied appendices in serial sections or he might have seen more of them. He said it was difficult for him to believe that they are as common in this section of the country as in the material which Dr. Bulkley has shown tonight. Dr. Bell said he usually chose three levels in the appendix for sections. He believed the basis of appendicitis is well established; that anything which denudes the mucosa is liable to cause infection, so it is easy to see how these worms can give rise to appendicitis. He had seen appendices postmortem with worms in them that had not caused symptoms. Pathologists in general have not felt that parasites are the cause of appendicitis. They do not know what starts the inflammation but the bacteria of the intestinal tract are about the only bacteria that are found in the pus. Something happens that opens a passage into the mucosa and anything that can do that can cause appendicitis, but no one has offered any explanation as to just what the thing is that starts it. Efforts have been made by some to connect it with sore throat, gallbladder, etc., but so far none of that work is convincing. Dr. Bell stated that it might well be that these parasites which Dr. Bulkley has shown play a much more important role than has yet been credited to them.

Dr. Bulkley added that there is another phase of the subject of parasitic infestation of the appendix which although it does not bear on the etiology of appendicitis does nevertheless possibly throw some light as to why clinically oxyuris and trichocephalis infestation of the intestinal tract is so difficult to cure. In practically all of the examinations made in connection with the work just mentioned there was found in the lumen of the appendix both sexes of the infesting parasite. As far as is known, neither cathartics, anthelmintics nor rectal medication have any effect toward emptying or washing out the inside of the appendix. It is not improbable that these parasites breed within the appendix and that it is for this reason that the medical treatment designed to eliminate them is so often a failure. Dr. Bulkley cited an instance of a woman in the fifties who since childhood had been known to have infestation with the oxyuris and who never at any time had had symptoms referable to her appendix. This patient because of distressing itching about the anus had repeatedly throughout her life made serious attempts under medical supervision to rid herself of these worms but without success. Dr. Bulkley removed this woman's appendix with the sole object of clearing up this woman's infestation. The appendix itself was normal but was found to contain parasites of both sexes. This woman received no further treatment whatsoever designed to eliminate her parasites; nevertheless her anal itching ceased and repeated stool examinations over a period of two years failed to again show parasites or their ova. This case was previously reported in the Annals of Surgery in 1912.

Dr. J. F. Corbett felt there were many phases of this discussion. He said he realized how serious it sometimes is to slip up on a diagnosis of appendicitis, and recalled a colleague who had what seemed like a very mild attack of appendicitis, although Dr. Corbett himself did not feel that it was. The next attack was a fulminating one and the man almost died. He felt that surgeons should not lean too far back in their diagnoses. Some points which Dr. Bell mentioned, *i.e.*, the danger of lawsuits and the unscrupulous surgeons operating unnecessarily, are two things which should be kept in mind. Dr. Corbett asked the members for a full discussion of this interesting paper and Dr. Bulkley's report.

Dr. F. A. Olson said he wished to congratulate Dr. Peterson on the completion and presentation of this very fine piece of work. He also wished to congratulate Dr. Bell, who had suggested and stimulated the research.

Dr. Olson believed the investigation has added a very valuable and definite clinical entity, *i.e.*, "chronic recurring appendicitis." At no time during the clinical development of this syndrome is a definite acute exacerbation seen, but, as the title implies, the disease presents with chronically recurring symptoms and pathological changes as regards the appendix.

Up to date, the diagnosis and classification of chronic appendicitis has not been so uniform and clear-cut in its differentiation in the various medical centers and clinics. It would seem, Dr. Olson went on to say, that a more universal appreciation of the facts that Dr. Peterson has brought out in this excellent paper would clear up many differential diagnoses. Particularly would this be true in the large number of patients with gastrointestinal complaints, often indeterminate and bizarre, where a definite organic basis is difficult to diagnosticate.

Dr. Olson said he would like to ask Dr. Bell and Dr. Peterson under what classification they would put an appendix which is apparently normal in appearance when it is removed between attacks of appendicitis.

Dr. Peterson said he felt that Dr. Bell could answer some of these questions better than he could.

Dr. Bell stated, in reply to Dr. Olson's question, that after an attack of acute appendicitis, whether mild or severe, there is a period of healing which lasts a variable length of time depending upon the severity of the attack. If the appendix is taken out in that interval it shows some lymphocytes in the serous layer. During a second acute attack which may follow there will be be evidence of both the old and the recent attack. The stage of healing is the "interval appendix." In the course of time the healing goes on until there is nothing left. One can't say that the patient never had appendicitis but one can say there is no appendicitis at that particular time. There isn't anything known to the pathologist that is chronic in the sense of a low-grade infection. There are acute exacerbations. Everyone knows that appendices heal. The appendix which has an obliterated lumen is found in nearly half the adults and in many people who have never had any symptoms. It is found postmortem. And the fact that the patient gets well after the operation does not mean that the operation cured the patient. It might have been some other phase of hospital treatment, diet, etc. And some of the cases which had a normal appendix did not get rid of their trouble. Dr. Bell said that none of the men in their discussions had told him what the pathologists should put on the hospital charts in some of these cases.

Dr. Corbett said he could not help but feel that judgment must come in where arbitrary rule leaves off, and the pathological department should exercise discriminating powers. The unprincipled man should be brought to light but careful conscientious surgeons sometimes remove a normal looking appendix and care should be exercised that such cases were not made to serve the ends of the shyster lawer. The only chronic appendicitis he could recall was one that had a pin sticking through it. In addition an appendix, once the site of rupture and an abscess, proved normal on examination when it was removed six months later.

Dr. J. A. Johnson said he could not see that there is anything to hide in these cases. Why not be perfectly frank in regard to the appendix? Why not call them "inactive appendicitis," for that is what they really are?

Dr. S. R. Maxeiner was of the opinion that Dr. Bell's statement, "No acute inflammation to be found at this time," covers the situation very well. No one could tell definitely what had taken place before that.

After the scientific program, a short business meeting was conducted. The President called upon the Secretary to read the minutes of the October meeting, and these were approved as read. The Secretary reported that the Council had already approved the application of Dr. H. M. Lee and his name should be voted upon at this meeting.

Upon ballot, Dr. Lee was unanimously elected to membership in the Society.

The President reported that the matter of a new lantern had been investigated further, and it was decided to continue using the small lantern for ordinary slides and the one in the auditorium for microscopic slides when necessary.

The meeting adjourned, after the President called upon the members to send in the titles of interesting case reports so that the programs for future meetings might be arranged satisfactorily.

H. O. McPheeters, M.D., *Secretary.*

THE ABSORPTION OF LEVULOSE

Various investigators have asserted that levulose is particularly valuable in the dietary of patients with diabetes. Perhaps the most enthusiastic report, among the conflicting statements, is that of Joslin, who is inclined to believe that levulose can be used with advantage in the diabetic diet in small amounts daily for intermittent periods. Levulose seems to cause a different type of metabolism from dextrose, possibly because of the conversion of levulose in part into fat in diabetes or to a more active stimulation of the production of insulin. A recent investigation has shown that levulose is not changed to dextrose in the intestines. Whatever transformations occur take place beyond the seat of absorption. (Jour. A. M. A., October 24, 1931, p. 1230.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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EYE, EAR, NOSE AND THROAT

THE SIGNIFICANCE OF THE SQUAMOUS EPITHELIUM IN THE CAUSE AND REPAIR OF CHRONIC MIDDLE EAR DISEASE: Ralph Almour (Trans. Amer. Acad. of Ophthalm. and Otolaryng., 1930, pages 357-377). According to Wittmaack the normal process of pneumatization consists of three stages: first, the ingrowth of subepithelial connective tissue into the marrow spaces; second, the contraction of the subepithelial tissue; and third, the sinking in of the epithelial covering.

The catarrhal type of infantile otitis results when meconium or any other foreign body finds its way into the middle ear during the early stages of respiration. A foreign body irritation occurs producing localized destruction of areas of the epithelium in the middle ear and later hyperplasia of connective tissue. Thus the process of pneumatization ceases at the end of the first stage. A metaplastic bone formation occurs resulting in what we call a sclerotic mastoid process.

If suppuration occurs, the type of mastoidal structure found will depend upon what stage of pneumatization had developed within the mastoid at the time of the onset of infantile suppuration. If suppuration sets in before the first stage, a mastoid will be developed with its spaces filled with marrow, and it is termed diploetic. If suppuration occurs in the first stage, a partially pneumatized mastoid process results.

The development of chronic suppurative otitis media depends on what degree of pneumatization has occurred in the mastoid. An individual with a normally developed mastoid will develop an acute mastoiditis from a suppurative middle ear condition rather than a chronic aural suppuration. An individual with a faulty pneumatization of the mastoid cannot develop an acute mastoiditis. In this case the aural suppuration will produce an acute otitis media which will heal or produce a chronic suppuration of one form or another.

There are two types of chronic otorrhea—tympanic mucosal suppurations and suppurations kept up by the ingrowth of squamous epithelium. The type of mucous membrane remaining after the catarrhal type of otitis media neonatorum is a hyperplastic mucosa. The tendency for an acute suppurative otitis to develop into a chronic purulent otitis of the catarrhal type depends upon the degree of hyperplastic mucosa present as a result of infantile otitis of the catarrhal variety. This type is always associated with a large persistent central perforation of the drum. The squamous epithelium grows through the perforation from the outer to the inner surface of the drum. The mucosal epithelium, being higher at the periphery, resists the ingrowth of squamous epithelium here. When the ingrowth of squamous epithelium is stopped, the size and shape of the perforation does not develop any further.

The second type of chronic otorrhea is dependent upon the ingrowth of squamous epithelium into the middle ear and its adjoining spaces. This type also depends on the previous occurrence of an infantile catarrhal otitis. For the development of this type adhesive bands must be present. These afford easy access of epithelium into the middle ear. As the epithelium grows into the middle ear it replaces the mucosal epithelium. Where the two kinds of epithelium meet, there appear to be granulations. The squamous epithelium undergoes its normal process of desquamation and these products act as an irritant to the mucosal epithelium. This produces a chronic inflammation of the mucosa which in turn acts on the squamous epithelium, producing a condition similar to eczema. Usually the ingrowth of squamous tissue continues until the entire middle ear is covered with it.

Squamous epithelium also takes part in the production of a cholesteatoma. The middle ear and accessory spaces are completely filled with the products of epithelial desquamation. These are not thrown off but accumulate and cause a definite increase in the size of the spaces.

A cholesteatoma may be primary or secondary. If primary, it is formed without inflammation. It usually occurs from mechanical causes. The adhesive bands which are present in the middle ear may separate the aditus and antrum from the tympanum. The air is absorbed in the walled off aditus and antrum, Shrapnell's area of the drum is subjected to negative pressure, a transudate occurs in the middle ear, Shrapnell's membrane recedes until it reaches the walls of the antral space, it becomes adhered here and finally ruptures from the negative pressure. The squamous epithelium then rapidly proliferates into the aditus and antrum, the products accumulate and a cholesteatoma forms.

Another form of chronic purulent otitis media due to the catarrhal type of otitis media neonatorum is that which occurs in scarlet fever and in connection with debilitating diseases like diabetes or nephritis. It is produced by a widespread thrombosis of the vessels of the submucosa leading to a mass necrosis of the mucous membrane. In severe cases the periosteum becomes involved. If all the mucosa is not destroyed, healing may occur from regeneration of the remaining mucosa. In cases where the mucosa is entirely destroyed, healing occurs through the ingrowth of squamous epithelium. If the antral lumen is retained as such, the epithelium grows into it and forms a secondary cholesteatoma.

James Brusegard, M.D.

GYNECOLOGY AND OBSTETRICS

GUM ACACIA IN THE TREATMENT OF ECLAMPSIA: William J. Dieckmann (Am. Jour. Obst. & Gynec., Vol. XXII, No. 3). The author postulates that in eclampsia there is an absolute or a relative decrease in blood volume with abnormal concentration. This explains many of the chemical changes described by various investigators. The faulty circulation leads to "tissue acidosis" and accumulation of waste products. The concentrated blood has a short coagulation time, predisposing to intravascular thrombosis and to the pathological lesions characteristic of eclampsia.

It is generally accepted that during normal pregnancy there is a true hydremia which may be accentuated in pre-eclamptic conditions. During eclampsia there is a concentration similar to that seen in shock and burns. The condition requires a form of treatment which will replace water in the circulation and retain it there. The use of glucose solution intravenously is usually effective and leads to clinical improvement. In certain cases, however, the dilution could not be maintained. For these, blood transfusion is not advisable because of the already high hemoglobin, cellular content, and viscosity. On theoretical grounds the author believed that gum acacia solution would serve to accomplish this purpose.

His clinical experience with a small number of cases confirms this idea. He advises the use of from 500 to 1,000 c.c. of a 6 per cent solution of acacia prepared by Eli Lilly & Co.

He concludes: The principal change in the blood in eclampsia is a concentration which may be absolute or relative. Relief of this condition is usually accompanied by clinical improvement. Hypertonic glucose has previously given the best results in relieving this condition.

Gum acacia solution has cured patients who did not respond satisfactorily to our usual methods of treatment. The probable explanation is that an injection of the gum acacia solution increases the blood volume, lowers the viscosity and thereby improves the circulation through the tissues.

A. L. McDonald, M.D.

EPINEPHRIN IN THE TREATMENT OF THE DYSTOCIA OF DEMELIN (Spastic contraction of the uterus): Pierce Rucker (Gynecologie et Obstetrique, Vol. XXII, No. 5). The author reviews experiments conducted upon the uterus during labor showing the effects of epinephrin 0.3 c.c. of a 1 to 1,000 solution given hypodermically, resulting in a definite and constant arrest of uterine contraction for a period of from nine to thirty minutes. These findings have been confirmed by other independent investigators.

The action of epinephrin upon the uterus during pregnancy and labor has the following applications.

1. To prevent abortion or premature labor. The use of 0.3 c.c. of a 1 to 1,000 solution of epinephrin has proven more efficacious than morphine or atropine.
2. To overcome the effect of uterine hypertonus or contracture in prolonged labor. The same medication gives satisfactory rest and relaxation, after which labor proceeds normally.
3. In cases of prolonged labor complicated by annular contracture, the so-called "Bandl's Contraction Ring," hypodermic injection of 0.5 c.c. of a 1 to 1,000 solution of epinephrin was followed by a period of relaxation greater than that produced by anesthesia alone, and sufficiently prolonged to permit of surgical delivery by version or forceps.

A. L. McDonald, M.D.

MEDICINE

A STUDY OF FIVE HUNDRED DIABETICS: Elmer L. Sevringhaus, M.D. (Amer. Jour. of Med. Sci., September, 1931). This article is of considerable interest to the practitioner who is treating diabetics. This is a study of five hundred cases which were admitted to the Wisconsin General Hospital. These cases came from rural districts.

Of these five hundred cases, 60 per cent required insulin on discharge.

Pulmonary tuberculosis, which has been said to occur in about 4 per cent of diabetics, was found in only about 2 per cent of this series. This may be explained in the fact that these patients came from rural districts.

Pain in the extremities, which is a rather frequent complication of diabetes, occurred in 36 per cent of this series. As a therapeutic measure they recommend alternate warm and cold applications, but they recommend highly the use of the Buerger passive exercises for the legs, which has given real symptomatic help in many instances. However, the relief from pain does not become evident until the exercises have been used for three or four weeks. Leg pains in the second and third decades are commonly of the cramp type, and are promptly relieved when diabetic therapy is adequate.

The causes of death include sepsis, cardiovascular-renal disease, and coma, in the order of importance. Pyogenic infection after gangrene, and pneumonia, are the commonest infective processes leading to death. The significance of cardiovascular-renal disease in the diabetic is discussed, and is of such a common occurrence that it should receive more consideration than it usually does.

The occurrence of ketosis at the time of admission, or first examination, is shown to be a good evidence of the need of insulin. This, again, is a practical point worth keeping in mind.

RICHARD BARDON, M.D.

PNEUMOPERITONEUM IN THE TREATMENT OF TUBERCULOSIS: Andrew L. Banyai, M.D., Muirdale Sanatorium, Wauwatosa, Wis. (Amer. Jour. Med. Sci., Sept., 1931). The author in a résumé of tuberculous enterocolitis emphasizes the frequency of tuberculous ulceration (60 to 90 per cent) in autopsies. Steinbach noted 61.5 per cent of 127 positive autopsy findings in which the condition had not been recognized during life from absence of physical signs. Attention should be paid to all forms of gastro-intestinal distress and of *nervous irritability* and the fact the patient is not doing well. Diarrhea is not characteristic of ulceration of the large intestine. Rigidity of the abdominal wall is indicative of disease of the serosa.

While it is possible to establish a diagnosis upon these symptoms and physical findings, alone, the X-ray should corroborate all cases. The Stierlin sign—a filled terminal ileum and filling-defect in cecum and ascending colon—receives due emphasis. Diagnosis may still fail in some cases because of the absence of subjective signs, and of the unreliability of roentgenologic findings. Therapeutic pessimism is not justifiable because healed ulcerations are noted clinically and by postmortem examination.

The cure is dependent partly upon early diagnosis. "The only proper method is to anticipate symptoms" (Stewart). The treatment should be (1) prophylactic, (2) dietetic, (3) medicinal, (4) radiational, (5) surgical, (6) pneumoperitoneal. The prophylactic treatment includes HCl to prevent anacidity. The diet should be small in bulk, cellulose-free, of easily-assimilable foods, of smooth consistency. Liquid foods are required when there is much diarrhea. Entirely salt-free diet is badly borne.

The medical treatment includes calcium intravenously, and bismuth, astringents, atropine and opium. Radiation by natural and artificial sunlight yielded 85 per cent symptom-free after six months' treatment.

Early exploratory laparotomy is used only in mildly active or quiescent pulmonary disease without marked gross anomalies, on constitutional symptoms, also in cases in which the roentgen findings and physical signs indicate a well localized lesion of cecum or ileum occurring late in chronic or intermittent types of pulmonary diseases.

Pneumoperitoneum with oxygen was used by Banyai in 44 per cent of his cases. Time: between breakfast and lunch. The bladder was emptied before operation. Enemas and cathartics avoided. Codein was given for cough. Site of entry—three fingerbreadths below and left of umbilicus. Anesthetic 1 per cent novocain. A small skin-incision admitted the Floyd-Robinson needle, which was slanted upwards towards the mid-line. Manometer readings are made as in pneumothorax, but are not of as great value as in the thorax. The intra-abdominal pressure is neutral in untreated cases. The operator judges chiefly by the lack of resistance when the needle enters the peritoneal cavity. Positive pressure occurs usually after 300 to 500 c.c. of oxygen. The disappearance of dullness and the subjective impressions of the patient are useful guides. Absence of liver dullness follows full doses. From 300 to 1,200 c.c. are used. The largest amount injected was 1,500 c.c. The smallest 150 c.c. There may be discomfort due to tension. The patient is usually allowed to walk back to his room and the daily routine is not changed except when there is discomfort from over-tension. Under-inflation rather than over-inflation is desirable. The mechanical effect of oxygen upon the lesions is not exactly known. Oxygen increases all cell-activity. It is known to cause irritation of the peritoneum and serous larger of the intestinal wall. A decrease in peristalsis was noted. The ideal includes maximum immobilization, improved nutrition, immune-body supply, stimulation of phagocytosis and the neutralization of toxic products. The essayist used the procedure only in those cases which did not show a satisfactory response to dietetic and medicinal treatment. Symptomatic relief was shown in 70.4 per cent. Complete relief was seen in 31.8 per cent. No relief in 29.6 per cent. The results were considered sufficiently encouraging to warrant a more frequent use of the method.

J. G. LAMONT, M.D.

PEDIATRICS

TREATMENT OF WHOOPING-COUGH WITH CONVALESCENT SERUM: J. C. S. Battley, M.B. (Tor.), Port Huron, Mich. (Arch. Ped., Vol. XLVIII, No. 10, October, 1931). Forty infants, who undoubtedly had been exposed to others suffering from whooping-cough, were given two to three c.c. of pooled serum taken during the fourth week of illness, at which time it had been found that the antibody content of the serum was highest, as shown by complement fixation tests. Of these patients, thirty-one were entirely protected, six had a mild illness, and three had the usual attack. Debre concluded that if the serum is injected before the end of the incubation period the onset of illness is prevented, if at the end of the incubation period the disease appears in mild form, if during the invasion period it is not affected. Gillot gave whole blood subcutaneously, taken from persons who had had whooping-cough a long time before, in a series of children from one month to six years of age. He found that four children injected before the catarrhal stage began were completely protected and two injected during the catarrhal stage suffered from a mild attack. In another series, blood of fathers and mothers without a history of whooping-cough was used. Six children injected before the catarrhal stage escaped the disease and five injected during the catarrhal stage had a mild attack. Doses of two to four c.c. of blood were used, the larger for the older children.

Convincing evidence of the value of convalescent serum must await extensive observation. Meanwhile, convalescent serum or convalescent whole blood, or even the blood of persons who have had whooping-cough in childhood, should be worthy of trial for prevention and treatment.

R. N. Andrews, M.D.

ROENTGENOLOGY

THEODOR BARSONY AND ERNST KOPPENSTEIN: CONCERNING THE SHADOWS IN THE UPPER LUNG-FIELD (Fort. a. d. Geb. der Roentgenstrahlen, September, 1931, 44:320). The authors discuss the appearance and significance of certain little known or confusing shadows in the upper lung fields. The "companion-shadow of the second rib" (of Albers-Schönberg), the "lateral companion-shadow," and the "medial curved shadow" (now described for the first time) are all normal manifestations but are of importance as they occur in regions susceptible to pathological changes. Each is illustrated and discussed in detail. Figures are given for the frequency of the occurrence of each in roentgenograms of 200 lung apices.

A triangular shadow with its broad base lying against the chest wall may occasionally represent the upper end of an atypically placed main interlobar fissure.

At the medial angle of the scapula is a round soft tissue shadow which represents the attachment of the upper portion of the serratus anterior muscle.

The shadow of a deep-seated groove for the clavicle may be mistaken for a cavity, while the summation shadow of the sterno-cleido-mastoid and the first rib may simulate an adhesion.

Frederick B. Exner, M.D.

MEDIASTINAL TUMORS AND THEIR COMPARATIVE SENSITIVITY TO IRRADIATION: S. Lamarque and J. M. Bert (Jour. de Radiology et Electrology, August, 1931, XV, No. 8, pp. 416-26). The authors have seen two cases of mediastinal tumor recede under X-ray therapy and compare the response to treatment in the two cases according to sensitivity. The first case was a girl of fourteen years who had a mediastinal lymphocytoma that completely disappeared in eight months under X-ray therapy and had not recurred after two and one-half years. The second case is a man of twenty-seven years who had a lymphogranulomatosis (Hodgkin's disease) that disappeared after one year of X-ray therapy and had not recurred after nineteen months.

Mediastinal tumors may be divided into lymphoid and non-lymphoid types. The lymphoid tumors may occur with or without blood changes, and the response to X-ray therapy is good although the ultimate prognosis is bad because of recurrences. The response to therapy is not as good in Hodgkin's disease and the prognosis is poor because of local and general recurrences. Treatment is most effective in the early stages of the disease.

They conclude that histology is the most important factor in treatment. Mediastinal tumors can be classified according to their response to therapy as well as their histologic structure. This constitutes a therapeutic test and the response varies with the type of tumor. Clinical and experimental work has shown good response in lymphoid and hematopoietic organs. X-ray today is the most powerful, curative or palliative treatment of mediastinal tumors although its results are usually temporary.

Jacob Sagel, M.D.

SURGERY

SPLENECTOMY—ITS INDICATIONS AND TECHNIC: David P. D. Wilkie, F.R.C.S., Edinburgh (Amer. Jour. Surg., Vol. XIV, No. 1, October, 1931). This article, which reviews briefly the indications for splenectomy in cases of splenomegaly associated with definite blood changes, is especially interesting for the definite and detailed description of the operative technic, with illustrations. The three blood dyscrasias in which splenectomy is done are briefly described, including splenic anemia, hemolytic jaundice, and chronic purpura. Cases exemplifying each type are reported.

The description of the operation itself is unusually clear, so that it is herewith abstracted verbatim:

"In textbooks of operative surgery no operation is described so inadequately as splenectomy. Whether the spleen be normal in size or grossly enlarged there are certain points in anatomy which must be appreciated if its surgical removal is to be rendered easy and safe. The organ lies very deeply in the left hypochondrium and is maintained in position by the lienorenal ligament up the medial border of which run the splenic vessels. The outer leaf of this ligament is short and in splenomegaly is often thickened. It forms an effective barrier to delivery of the spleen into the wound and it must be divided as a definite step in the operation before any attempt is made to deal with the splenic pedicle. In order to expose the front of this pedicle the gastrosplenic omentum must be divided, the vasa brevia being ligated, and, that ready access to the pedicle in case of mishap may be insured, this should be the first step of the operation. The gastrosplenic omentum is very short at the upper pole of the spleen and care must here be exercised in ligating. It is of advantage to leave this short uppermost portion till a later stage in the operation when complete mobility of the spleen has been secured. That the stomach may not impede the view of the splenic pedicle it is a good practice to pass a stomach tube and leave it *in situ* during the early stages of the operation.

"Now comes the most important step in the operation. A hand is placed over the phrenic surface of the spleen and the organ is gently pulled over to the right. At the same time, the left costal margin is retracted and the outer leaf of the lienorenal ligament, which has been rendered tense, is exposed. With a long-handled knife the peritoneum of the ligament is divided and the spleen comes forward. With a second touch of the knife the thickened subperitoneal areolar tissue or fascia propria is divided and the spleen completely mobilized. No difficulty is now encountered in delivering the spleen in the abdominal wound. The upper end of the gastrosplenic omentum is now readily accessible and the very short vessels running from the stomach to the upper part of the splenic hilum are ligated and divided.

"The main splenic pedicle is now raised on two fingers of the left hand. The splenic artery which lies uppermost is freed, doubly ligated and divided. After a pause to allow of venous drainage and thus minimize loss of blood, the splenic vein is similarly dealt with. The tail of the pancreas can now be dissected off and the spleen removed. There should be no hemorrhage.

"Summarized the steps of the operation are as follows:

1. Anesthesia.
2. Passage of stomach tube.
3. Left paramedian incision.
4. Ligation and division of the gastrosplenic omentum.
5. Spleen gently pulled to right and with a long knife the peritoneum forming the outer leaf of the lienorenal ligament divided. The underlying fascia propria is also divided.
6. Spleen delivered in wound and extreme upper end of gastrosplenic omentum divided between ligatures.
7. Pedicle raised on fingers.
8. Splenic artery doubly ligated and divided.
9. Splenic vein doubly ligated and divided.
10. Tail of pancreas dissected off.

"There is no abdonimal operation in which a deliberate plan, based on antomical knowledge, is more essential than in splenectomy. In dealing even with the largest spleen, hemorrhage need not occur if such a plan be followed, and what some have called adhesions are, I believe, merely anatomical attachments thickened to support the weight of the enlarged organ. Speed is of no importance in the bad risk splenectomy; infinite care to preclude the possibility of hemorrhage is all-important."

A. E. SOHMER, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

CERTIFIED MILK. Conference held in 1931. 334 pages. Brooklyn, N. Y.: American Association of Medical Milk Commissions, Inc., 1931.

THE HUMAN VOICE. Its Care and Development. Dr. Leon Felderman. 301 pages. Illus. Price, $2.50. New York: Henry Holt & Co., 1931.

HEALTH PROTECTION FOR THE PRESCHOOL CHILD. (The White House Conference.) 275 pages. Price, $2.50. New York City: The Century Company, 1931.

CONQUERING ARTHRITIS. H. M. Margolis, M.D. 192 pages. Illus. New York: The MacMilan Company, 1931.

VERTEBRATE ZOOLOGY. Casey A. Wood, M.D., LL.D., Collaborator, Division of Birds, Smithsonian Institution. 643 pages. Illus. Price, $15.00. London: Oxford University Press, 1931.

A DOCTOR OF THE 1870's AND 80's. William Allen Pusey, A.M., M.D., LL.D. Sometime President of the American Medical Association and the American Dermatological Association. 153 pages. Illus. Price, $3.00. Springfield, Ill.: Charles C. Thomas, 1932.

A NON-SURGICAL CONSIDERATION OF PROSTATIC ENLARGEMENT. Edwin W. Hirsch, M.D. Associate in Urology, College of Medicine, University of Illinois, Urologist, Englewood Hospital, Chicago. 79 pages. Illus. Price, $2.00. Saint Paul, Minnesota: Bruce Publishing Company, 1931.

AN INTRODUCTION TO THE LITERATURE OF VERTEBRATE ZOOLOGY. Based chiefly on the titles in the Blacker Library of Zoology, the Emma Shearer Wood Library of Ornithology, the Bibliotheca Osleriana (the Gest Library of Chinese Literature), and other Libraries of McGill University, Montreal, Canada. Compiled and edited by Casey A. Wood, M.D., LL.D., Collaborator, Division of Birds, Smithsonian Institution. 4to, pp. xix and 643. Col. frontispiece, $15.00 (3 guineas). London: Oxford University Press, 1931.

In an Introduction to the Literature of Vertebrate Zoology, Dr. Wood has written nineteen chapters or about 149 quarto pages in his characteristic and entertaining way from the beginnings of zoological records from early Greek and Oriental zoologists down to the present day. For those who read these chapters, will be found an enormous amount of painstakingly acquired information on all phases of Vertebrate Zoology, and written in a pleasing style which takes on a personal interest for those who know Dr. Wood.

This introduction gives a review and comments on the books, periodicals, and manuscripts contained in the Libraries of McGill University. Their files are replete with rare and important writings in vertebrate zoology and especially in ornithological literature.

This catalogue is indexed under general treatises on vertebrate zoology of the world, subdivided under birds, mammals, fishes, and reptiles and batrachians. This is followed by an index, a geographical catalog under continents, countries, and island groups. The main part of the work follows in 469 quarto pages of alphabetically arranged authors' and periodical titles in the McGill University Libraries. There are throughout the catalog under-titles, comments and résumés by the author which make this work a most valuable catalog for anyone interested in the literature of vertebrate zoology.

John C. Brown.

CONQUERING ARTHRITIS. H. M. Margolis, M.D. 192 pages. Illus. New York: The Macmillan Company, 1931.

On the whole the field for books on disease written for the patient is limited. One is inclined to be rather antagonistic at first to the idea of a book written by a doctor for the arthritic patient. This volume, however, gives the essentials of the present status of medical knowledge about the cause, classification and treatment of arthritis, as well, at least, as can be given on a subject about which medical knowledge is so woefully incomplete. A chronic arthritic patient is so likely to become discouraged and resort to perfectly useless and costly methods, grasping at a straw for some cure, that it seem very probable that this volume will meet a real need.

C. B. Drake, M.D.

THE INTERNATIONAL MEDICAL ANNUAL. Wm. Wood & Co., New York. Price, $6.00.

The 1931 volume of this annual is the forty-ninth of the series. The British editors and contributors have again succeeded in including in this fair sized volume a summary of the progress made in the entire field of medicine and surgery with the exception of pathology. The sources have been international.

Recent work or undulant fever, iodine compounds for intravenous urography, hyperinsulinism, sympathectomy are typical inclusions.

The book is not too large for a complete reading, and solves in part the impracticability of keeping up with the mass of modern medical literature. It should be of particular value to the general practitioner.

C. B. Drake, M.D.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XV 15 FEBRUARY, 1932 No. 2

LUMBAR ANESTHESIA—RÉSUMÉ OF 751 CASES*

W. C. STILLWELL, M.D., F.A.C.S.
Mankato, Minnesota

WE find that our patients are much less apprehensive when we refer to "lumbar" instead of "spinal" anesthesia. A more correct term would be spinal subarachnoid block instead of subdural or intradural anesthesia as it is so often wrongly termed in our literature. Placing the anesthetizing drug under the dura instead of under the arachnoid membrane is a frequent cause of failure in obtaining a good anesthesia.

Lumbar anesthesia was first discovered by J. P. Corning in 1885, when he accidentally punctured the spinal membranes while injecting cocaine into the spinal region to control pain. Bier and Hildebrand in 1898 had the courage to demonstrate upon themselves. They injected .5 c.c. of 1 per cent cocaine solution into the spinal canal of each other. The anesthesia was apparent only in Hildebrand. Failure to obtain anesthesia in Bier was due to a leaky syringe and most of the cocaine solution was lost. Hildebrand described thoroughly the effects of the anesthesia as they developed and then later disappeared. He was quite sick for several days following the injection. Only during the past few years has lumbar anesthesia emerged from its slumbers to take its rightful place among the various methods of anesthesia. The work of Babcock, Labat, Jonnesco, Koster, Evans, Pitkin and others has done much to eradicate our doubts and misgivings and to place lumbar anesthesia on a definite comprehensible basis.

In our series, lumbar anesthesia was induced in the great majority of cases by the so-called "volume speed control method." This method was adopted after trying various other methods, which had given equally good results in other hands. The novocain or neocain crystals are dissolved in the spinal fluid and this solution is re-injected into the subarachnoid space without barbotage, thus obviating the chance of misplacing the needle during such maneuvers. It is probably the most simple and least technical of all methods.

Kirschner has recently devised a method by which he induces a belt anesthesia which is limited to the field of operation. He places the patient in the lateral position with the head down, and after inserting the needle (which has special features) into the spinal canal, he replaces the spinal fluid in the lower part of the canal with air. He then introduces his anesthetizing solution of lesser specific gravity than the spinal fluid and this floats on top of the spinal fluid, causing a localized anesthesia. He has devised a spinal double syringe to facilitate the injection of both air and the anesthetizing solution in varying amounts.

Preoperative medication has varied but usually consists of a sedative the evening before operation, and morphine sulphate, gr. 1/6 by hypodermic with nembutal, grains 3, per os, one hour before operation. This usually allays all nervousness and eradicates any psychic trauma. It is often noticed that a restless patient will become very quiet and go to sleep during a high abdominal anesthesia. Such an effect cannot be attributed to vascular depression as it occurs when the blood pressure has remained normal. This phenomenon may be due to the blocking of adrenal glands through the sympathetic system, or to a high diffusion of the drug to the cerebral cortex.

The dosage of novocain used has varied from

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*Read before the Southern Minnesota Medical Association, Faribault Minnesota, August 24, 1931. Since this paper was written the series of lumbar anesthesia cases has been increased to over 1,000 cases.

50 to 350 mg., and is gauged according to age, weight, general condition of patient, level and duration of anesthesia desired. Ephedrine sulphate is given subcutaneously in doses of 30 to 120 mg., at the puncture site. Although Labat emphatically states that ephedrine should not be used and apparently proves his statement from a theoretical standpoint, practical experience has proven that ephedrine has the desired effects and that it has a definite place in lumbar anesthesia. Ephedrine has a peripheral vasomotor action, especially upon the splanchnic vessels. We have omitted the ephedrine several times and have noticed a greater drop in blood pressure.

Our patients are not immediately placed in the Trendelenburg position, but are kept horizontal for 10 to 12 minutes until the drug becomes fixed. Later they may be placed in the Trendelenburg position if desired for better exposure of the operative field. However, in doing a cholecystectomy it is advantageous to keep the patient in the horizontal position so that the liver can be readily turned down and outward. In case of a sharp drop in blood pressure or evidence of shock, the table is at once tilted into the Trendelenberg position, but the necessity for this maneuver has been uncommon in our series. Following the operation the foot of the bed is elevated for several hours.

We can usually start the operation five to seven minutes following the injection, but occasionally it is necessary to wait longer. If the anesthesia is not satisfactory or high enough after five minutes we usually lower the head of the table to allow the drug to diffuse higher. This maneuver will be of little value if done after 10 minutes or more.

Table I shows the type of cases and is self-explanatory. It might be said here that most of the poor results were encountered during the early part of the series, and were probably due to faulty technic. At times when the operation has been prolonged over 60 or 70 minutes, it has been necessary to supplement with nitrous oxide-oxygen anesthesia. However, this can be avoided if larger doses of novocain are used.

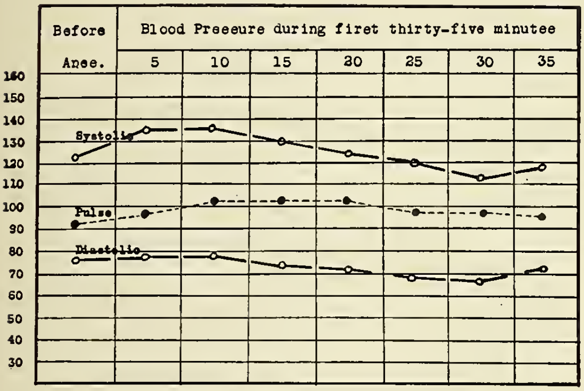
Table II is a classification of the complications and sequelæ which may follow lumbar anesthesia.

Low blood pressure or vascular depression is due to paralysis of the vasomotor center, especially affecting the great splanchnic pool, which is controlled by nerves from the region of the

TABLE I

TYPE OF OPERATION	LUMBAR ANESTHESIA						
	Number of Cases	Grade of Anesthesia			Supplemental (N^{2}O-O^2)		
		Good	Fair	Poor	Prolonged Operation	Fair Anesthesia	Poor Anesthesia
Appendectomy	148	143	4	1	0	1	1
Cholecystectomy	104	96	6	2	3	5	2
Pelvic Pathology	84	83	1	0	1	1	0
Abd. Hysterectomy	62	58	4	0	3	3	0
Rectal Pathology	60	60	0	0	0	0	0
Hernioplasty	56	54	2	0	0	2	0
Gastric and Intestinal	35	33	2	0	4	2	0
Prostatectomy	32	31	1	0	0	1	0
Cystoscopy	21	21	0	0	0	0	0
Vag. Hysterectomy	19	19	0	0	2	0	0
Operative Obstetrics	13	13	0	0	0	0	0
Orthopedic	11	11	0	0	0	0	0
Kidney and Ureter	10	10	0	0	0	0	0
Radical Breast	8	7	1	0	1	1	0
Ectopic Gestation	6	6	0	0	0	0	0
Amputation of Leg	6	6	0	0	0	0	0
Cesarean Section	5	5	0	0	0	0	0
Miscellaneous	71	64	4	3	1	2	3
Total	751	720	25	6	15	18	6

sixth dorsal to the third lumbar vertebra. Therefore practically all these vessels are dilated in anesthesia which extends to the lower chest region. The pulse theoretically is slowed because of unrestricted vagus action, but personally we have never noticed this marked slowing of the pulse.



Average Blood Pressure and Pulse - 100 Cases
Cholecystectomy - Lumbar Anesthesia

Chart I

Chart I shows the average blood pressure and pulse during 100 cholecystectomies. It is noticeable that the average blood pressure has remained at a very satisfactory level during the time which is considered the most dangerous period after the induction of lumbar anesthesia.

TABLE II.—COMPLICATIONS LUMBAR ANESTHESIA

IMMEDIATE

1. Low Blood Pressure
2. Nausea
3. Pallor—Cold Sweat
4. Respiratory Failure
5. Shock, Syncope, Convulsions

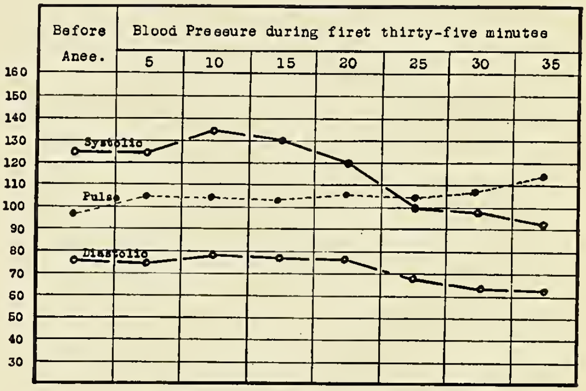
INTERMEDIATE

1. Headache
   a. Mild
   b. Severe
2. Backache
3. Bladder Disturbance
4. Meningismus
5. Ocular Manifestations
6. Meningitis

LATE

1. Persistent Headache
2. Nerve Injuries
3. Psychic Disturbances

Chart II shows the average blood pressure during the first 35 minutes in eight radical breast operations. Here the blood pressure showed a greater drop and the pulse quickened. Large doses of novocain were used in these cases because of the height of anesthesia desired and the length of time which might be required for completion of the operation. This type of case is greatly benefited by the intravenous injection of normal saline during or immediately after the operation. Larger initial doses of ephedrine may be given, the small initial dose may be supplemented later, or one of adrenalin may be given.



Average Blood Pressure and Pulse - Eight Cases
Radical Breast Operation - Lumbar Anesthesia

Chart II

Hypertension cases show a greater drop in blood pressure, which may be due to the fact that ephedrine acting as a peripheral vasoconstrictor has less effect upon sclerotic arteries. Hypotension cases respond very nicely to ephedrine and, at the end of the operation, their blood pressure is often higher than before. We do not hesitate to use lumbar anesthesia because of hypotension unless this is due to a moribund condition or to great general debility.

In observing blood pressure readings it is a common mistake to consider only the systolic or driving force of the heart, and to disregard the diastolic pressure, which represents the tone of the peripheral vasomotor capillary bed. Life is dependent upon the diastolic pressure and when it falls below 40 mm. Hg. the oxygen dissociation curve reaches a point where oxygen is no longer available when the blood reaches the capillaries. At 60 mm. Hg. (MacLeod), the blood may be nearly saturated with oxygen, whereas at pressures below 50 it readily loses oxygen, and at 10 there is a complete loss of oxygen. It is therefore imperative that we keep up the diastolic pressure.

Nausea in this series has been present but not annoyingly so, and it has been less noticeable during the past few months. At times it seems that overaction of the ephedrine might be the etiologic factor in some cases. We recognize three types of nausea:

1. That due to psychic causes, evident when the patient is allowed to over-indulge in conversation. A few deep breaths usually suffices to stop this type.

2. Nausea due to lowered vascular tension. Treatment of this type is that of the low vascular tension.

3. Reflex nausea due to pulling or tugging of intra-abdominal viscera. This type usually stops as soon as the tugging ceases. Inhalation of oxygen with or without CO_2 is often of value in all three types of nausea.

Pallor or cold sweats are usually the result of mild shock which follows a marked drop in blood pressure. This has been quite infrequent but is a danger signal and calls for immediate action. Placing the patient in the Trendelenburg position usually suffices. It is advisable to have intravenous normal saline available for prompt use, if needed.

Respiratory failure is a greatly feared complication, which has done much to keep lumbar anesthesia from gaining widespread popularity. This much talked of complication has been attributed to the high diffusion of the drug in the spinal canal with its paralyzing action upon the respiratory center. However, it is the consensus of opinion that the dilution of the drug, by the time it reaches the bulbar region, is so great that it is almost impossible to paralyze the respiratory center by injecting the drug in the lower spinal region.

Koster has shown by animal experiments that the medulla is not affected by direct application of a 4 per cent novocain solution. Therefore it seems probable that respiratory failure is a result of bulbar anemia and should be treated as such. In lumbar anesthesia to the nipple line one often notes a slight degree of respiratory depression, such as shallow breathing or the patient may complain of a sense of constriction across the chest. Careful observation of the patient during the anesthesia is quite essential. We take blood pressure and pulse readings every five minutes and carefully note the patient's color. In fact, by watching the patient's face one can tell almost as much concerning his condition as by taking the blood pressure.

It is difficult to estimate the amount of vascular depression before an anesthetic is given. Often we have encountered a marked drop in blood pressure following a very low spinal tap, and when only 50 mgm. of novocain was injected. This is probably explained as a vasomotor reflex, due to the spinal tap itself. A marked drop of blood pressure is often encountered following a diagnostic spinal puncture.

Shock and syncope may immediately follow a lumbar puncture regardless of whether any drug is injected into the spinal canal. We have never seen such a reaction. Convulsions are possible when the drug is injected directly into one of the venous sinuses, which are plentiful surrounding the vertebræ.

Among the intermediate sequelæ we find that headache is the most frequent. It may vary from a mild type which clears up readily, to a more severe persistent type which requires careful treatment. In this series, headaches have been conspicuous by their infrequency and have usually occurred in patients who were allowed to be up within forty-eight hours following the operation. We recognize two definite types of headache: The mild type caused by reduced intraspinal pressure following leakage of fluid from the site of puncture, and the severe type due to increased intracranial pressure, probably due to irritation of the spinal membranes by the novocain, red blood cells in the spinal fluid caused by trauma, or foreign material entering at the time of injection. The mild type has always responded when the patient was placed in a recumbent position and on three occasions the headache disappeared after giving 0.5 c.c. of surgical pituitrin subcutaneously. Hypotonic solutions intravenously are also indicated in this type of headache. The severe type of headache has been encountered only a few times and has always responded to a hypertonic solution of glucose given intravenously. Spinal drainage may be used if the hypertonic solution does not relieve. Caffein sodium benzoate in 5 grain doses given intravenously will also markedly reduce the intracranial pressure.

Backache is a common complaint often made by the patient, who naturally believes that the needle inserted into the back is the cause of his pain. As a matter of fact, the majority of patients develop some backache post-operatively regardless of the type of anesthesia. Only a localized aching or pain can be directly attributed to the lumbar puncture. We have had patients complain that their backache is at the point of insertion of the needle, but upon asking them to locate the exact spot, we find it several inches away from the site of puncture. Lumbar anesthesia causes such a complete relaxation of the muscles that it is advisable to place a small hard pillow in the hollow of the back during the operation.

Bladder disturbances have not occurred more often in this series than have been encountered in cases where general inhalation anesthesia has been used.

Meningismus, ocular manifestations, and meningitis have not been encountered.

Late Sequelæ.—Persistent headache is probably due to meningeal irritation with increased intracranial pressure and an increased spinal fluid cell count. Iason, Lederer and Steiner have made studies of the spinal fluid following lumbar anesthesia and have found an increased cell count, and increased sugar reaction, in about 50 per cent of the cases. The headache is usually accompanied by some vertigo, stiffness of the neck muscles and other signs of meningismus. There have been no persistent headaches in this series.

Nerve injuries may be caused by careless lumbar puncture, and may manifest themselves in the form of paresthesia, anesthesia, paresis, sharp shooting pains into the lower extremities, and neurotrophic disturbances. They are, however, infrequent and have caused us very little concern. During lumbar puncture, on several occasions, the patient has complained of a sudden sharp pain shooting into the leg. This evidently was caused by the needle striking a fibre of the cauda equina, but has been of a transient nature.

Psychic disturbances, of which much has been written, have caused us no trouble and probably will not occur if proper pre-operative medication is prescribed.

Morbidity and Mortality.—Morbidity in lumbar anesthesia is certainly minimal. The small amount of novocain used has very little, if any, effect upon the tissue cells, and the kidneys, liver, brain and lungs show practically no toxic effect from the drug. Pulmonary complications are rare compared to those following inhalation anesthesia. In this series there have been several minor pulmonary infections but no post-operative pneumonias. We have encountered one case of massive pulmonary collapse.

Tendler reviewed 326,910 cases in which lumbar anesthesia was used with eighty deaths. His tabulation includes many different technics and drugs used. There are seven series of cases, totaling 22,365, in which there were no deaths. Tendler remarks that including all cases the mortality is one in 4,086 cases. However, in carefully reviewing these deaths, he finds that the greater number were in cases where approaching death was plainly evident, and death would probably have resulted regardless of the kind of anesthesia induced. In only nine or ten cases of the entire series was it evident that death was caused by the intraspinal injection. There have been no deaths directly resultant from the anesthesia in this series, but I wish to report one case in which the patient died about ten days after operation, of what appeared to be a clinical tetanus.

The patient was thirty-four years old, and was considered a good surgical risk. She was given lumbar anesthesia and reacted normally throughout the operation, which consisted of a colpoperineorraphy and a laparotomy for cystic ovaries and retroverted uterus. She convalesced nicely until the evening of the eighth day, when she complained of a headache and some stiffness of the muscles of the neck and jaws. During the night she developed a spasm of the jaws and bit her tongue several times. The next morning there was some stiffness of the masseters, and a slight rigidity of the neck. No Kernig or other abnormal reflex was demonstrated. She complained of some difficulty in swallowing and was quite irritable. Lumbar puncture revealed a clear fluid under slightly increased pressure. Examination of the fluid revealed a low normal cell count and no other abnormalities. That night she developed more stiffness of the jaws and dysphagia was more evident, simulating a hydrophobia. Reflexes at this time were equal but hyperactive. Another lumbar puncture revealed a clear fluid under slightly increased pressure and a normal cell count. Antitetanic treatment was instituted, and she appeared somewhat improved until the next morning. At this time the typical "risus sardonicus" was present. She developed tonic spasms of the diaphragm and died during the third spasm. Complete autopsy was refused but we were allowed to cut out the abdominal wound for examination. A cisterna puncture done at this time revealed another normal spinal fluid cell count. Thinking of a possible tetanus infection from catgut, we excised the abdominal wound and sent it to the laboratory for examination. The report later returned negative for tetanus. Later it occurred to us that we should have taken the perineal wound as well because of the possibility of tetanus infection following perineal and rectal surgery. Tetanus following surgery of this type is mentioned quite frequently in the foreign literature. There was no history of previous injury where the infection might have gained entrance. We do not believe this death can be attributed to the lumbar anesthesia.

Contra-indications for lumbar anesthesia may be grouped as follows:

1. It should not, under any circumstances, be employed in cases presenting involvement of the nervous system, such as brain tumors, meningitis, or intracranial hemorrhage.
2. It should not be used where local infection is present at the site of puncture.
3. Sub-standard risks should not be subjected to this type of anesthesia, except by those who are well trained in its use and who are able to combat any complication which may arise.
4. Grave icteric patients and those with marked cachexia do not stand any sudden change in the vasomotor system, and therefore should not be given lumbar anesthesia. Local infiltration is the method of choice in these cases. We have refused lumbar anesthesia on two occasions and have later seen the patient succumb on the operating table under infiltration anesthesia.
5. Patients in severe shock should not be subjected to lumbar anesthesia until measures have been introduced to raise the vasomotor tone. Patients in shock due to marked hemorrhage react poorly under this type of anesthesia, and are bad risks unless the bleeding is under control and blood transfusion is available. Shock not due to hemorrhage is not to be considered a contra-indication as favorable reactions occur with this method when properly used.

Conclusions.—We believe that lumbar anesthesia in competent hands is the safest and most satisfactory of all forms of anesthesia. Any surgeon who once becomes familiar with its ease of administration and its advantages both to the patient and himself, will never want to go back to other methods. The complete relaxation of the muscles (which is found only in the deep stages of ether anesthesia) and the quiet abdomen facilitate rapid and thorough surgery. During the anesthesia it is found that active intestinal peristalsis is present and that the kidneys show an increased urinary secretion. Post-operative complications are fewer, and much less severe than with inhalation anesthesia. Nursing care has been reduced to a minimum due to the lack of post-operative vomiting and abdominal distention. With the advent of newer and better drugs along with new technics, it is possible that a more localized and longer anesthesia may be available in the near future.

In summing up, I might quote Babcock, who says, "When properly employed, no other anesthesia of equal range leaves so few sequelæ."

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ACHLORHYDRIA AND HYPOCHLORHYDRIA IN PEPTIC ULCER*

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THE relationship between peptic ulcer and the acid content of the stomach is complex and has been the basis for many heated arguments between groups of internists and between internists and surgeons. Practically no one believes that hyperacidity *per se* can cause the formation of a peptic ulcer but it is very generally believed that hyperacidity prevents the healing of an ulcer.

Just what are the normal acid values determined with the Ewald test meal? Dr. B. W. Sippy and his successors have made a rough clinical grouping as follows: normal adult free hydrochloric acid ranges from 20 to 40 points; normal total acid values range from 40 to 60 points. Peptic ulcer typically causes higher acid values. This has been a fairly satisfactory standard for duodenal ulcers, though not so well adapted for gastric ulcers, since many gastric ulcers have acidities well within these so-called normal limits. Recently, Vanzant[1] has attempted to establish the normal range of gastric acidity from youth to old age by studying 16,000 records of patients having had gastric analyses. Of these, 3,381 were selected as having no evidence of disease of the gastro-intestinal tract, nor other serious conditions. To these he added data from 365 cases from the literature, in the younger age groups. The test meal used consisted of 8 arrowroot cookies and 400 c.c. of water. If no free HCl was found at the end of an hour, further tests were made each 15 minutes for 45 minutes longer. True achlorhydria was diagnosed only when the fractional test showed no free acid and this was confirmed by histamine injection. The incidence of achlorhydria was found to increase from 4 per cent at 20 years to 26 per cent at 60 years. The one-hour test showed considerably more apparent achlorhydria than was determined with the 1 and three-fourths hour fractional test or histamine injection. He found the typical free acidity in adults to be 35 units in females and 50 units in males. After the age of 50 this sex difference is reduced till at 65 years the males' free acid dropped to that of the females. He suggests that the three-times greater incidence of ulcer in men than in women may be associated with this decided sex difference in acidity. The total acid for adult females remained at about 51, whereas for males it ranged from 66 at 20 years to 56 after 65 years.

The incidence of hyperacidity and achlorhydria in cases of peptic ulcer has been variously reported. A complete review of the literature will not be attempted here, but reference will be made only to a few of the more complete and more recent studies. Rehfuss[2] in his book quotes Bell and Hunter as finding 70 per cent hyperacidity and no achlorhydria in duodenal ulcers. He himself found 78 per cent hyperacidity in duodenal ulcer. Moynihan is quoted as reporting 72.7 per cent hyperacidity for duodenal ulcers but only 20.9 per cent for gastric ulcers. The same author reported 13 per cent achlorhydria in gastric ulcers and 5.5 per cent achlorhydria in duodenal ulcers. The fractional method was used in these cases and the lesions were demonstrated at operation. Histamine was not used. Rehfuss states that the incidence of hyperacidity in gastric ulcer is no greater than the high acid values found in an equal number of normals, but the quantity of total acid by volume may be greater, due to a greater rate of secretion. He emphasizes the fact that gastric secretion *per se* does not produce ulcer, but in the presence of focal infection and other factors, it causes an extension and persistence of the lesion.

Brown[3] in a review of 1,224 cases of peptic ulcer gives figures showing hyperacidity in 75 per cent, normal values of free acid (20-40) in 22 per cent and below 20 points in only 3 per cent. From personal contact with the figures contained in this review, one of the present writers (J. A. W.) does not know of any case of true achlorhydria in this series. Several cases showed no free acid with an Ewald meal, but a therapeutic or nightly aspiration revealed free acid.

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The very high acid values in this series were usually in duodenal rather than gastric ulcers, and many of the gastric ulcers had normal or low free acidity.

Emery and Monroe[4] in a review of 556 cases of peptic ulcer also reported hyperacidity in 75 per cent and hypoacidity in 9 per cent. They state that patients having symptoms over 20 years had no higher acidity than patients with recent ulcers.

There have been many cases reported in the literature of peptic ulcer in persons with an achlorhydria. However, the number of such cases is not as great as one would be led to suppose, for various careful investigators have shown most of them to be only apparent achlorhydria and to have been incompletely analyzed. Emery and Monroe[4] in their series found ten cases of ulcer with no free acid reported after an Ewald or a fractional test meal. Of these, one had pernicious anemia and an X-ray diagnosis of ulcer, but no symptoms of ulcer. Several others showed free acid after a meal or a therapeutic aspiration, and others had a very high total acid. They state that "there is no proof that true achylia gastrica occurred in any uncomplicated case in this series." Eusterman[5] in 1921 described two cases of anacidity following gastro-enterostomy for ulcer where free acid had been present before the operations. In one case, even therapeutic aspirations and Riegel meals yielded no free acid. Food and alkalies relieved the pain, however. In neither case was histamine used as a stimulus. Palmer[6] has presented a most careful résumé of the literature on achlorhydria and ulcer and has analyzed critically the various cases reported. Several of these were not bona fide cases of ulcer for they died of carcinoma metastases three to five years later. He states that with one exception (Eusterman's case, cited above) these are all unproved achlorhydrias for they are so named on the basis of only one Ewald or Boas meal or a fractional Ewald or Boas meal. Histamine tests and therapeutic aspirations were not tried. He mentions eighteen cases at the Presbyterian Hospital in Chicago where the free acid varied from 0 to 70 points on repeated Ewald tests, which emphasizes the necessity for more than one test meal if no free acid is found. Several of his patients who had no free acid with a fractional test later showed normal values with an Ewald. He analyzed the records of 1,469 ulcer patients at this same hospital and found only seven who never showed any free acid at any time. Four of these were ruled out because only one test meal had been used. Another was later diagnosed as gastric lues at Rochester and proved so at operation by Dean Lewis. Another was ruled out for lack of proof of ulcer (gastro-enterostomy and gastric resection had changed the normal physiology), and the seventh case was found at necropsy to have been that of a healed ulcer, with symptoms due to other causes. Palmer also criticizes a few more cases with which he was familiar from the Mayo Clinic and from the Cook County Hospital, and finds two of these suggestive but not proved cases of achlorhydria. The only case in the literature where test meals and therapeutic aspirations for benign ulcer failed to show free acid is that reported by Eusterman.[5]

When one stops to consider the mechanisms which control the values of gastric acidity in ulcer one naturally thinks of the effect of the obstruction at the pylorus or in the duodenum and its influence in inducing hypersecretion. This undoubtedly is an important factor, but even of more importance are the interesting recent observations of Elman[7] and of Olch[8] on the regulation of gastric acidity by duodenal regurgitation. These workers have shown experimentally that the pancreatic juice normally regurgitates into the stomach and thereby neutralizes gastric acidity. If this secretion (pancreatic) is diverted to the exterior of the animal, gastric acid values mount materially and hydrochloric acid meals put into the stomach are neutralized much more slowly, thus delaying emptying of the stomach. Acid solutions injected into the stomach of these animals provoke an intense increase in pancreatic secretion (thereby normally helping to neutralize the acid by regurgitation). Elman[7] has shown that bile cannot aid this neutralization for it is actually acid in reaction, rather than alkaline, as was formerly assumed. Elman and Rowlette[9] have further shown that experimental division of the pyloric sphincter (as in the Rammstedt operation on infants and the Deaver and Judd operations for pyloric stenosis in adults) leads to persistent lowering of gastric acidity as measured by an augmented neutralization of an "acid test-meal." This, they believe, justifies the conception of the "pyloric control of gastric acidity" rather than unqualified acid control of the pylorus. Disease of the pancreas prevents the regurgitation of alkaline fluids which would be allowed by this sphincter excision. Carcinoma of the stomach often allows rapid regurgitation of pancreatic fluid, thus lowering the gastric acidity, due to a mechanical splinting of the walls of the stomach by the cancerous tissue. This mechanical splinting may likewise slow the emptying time of these stomachs, which the lowered acidity would naturally have tended to accelerate. These observations are further of clinical importance for they help to explain why duodenal ulcers usually have higher gastric acid values than do gastric ulcers (unless the latter are near the sphincter), for this regurgitation of pancreatic juice is lessened by the duodenal narrowing. They also explain why such good results in the healing of ulcer following the making of a large stoma, as in gastric resection, pyloroplasty, or gastro-enterostomy. Many cases of hypoacidity and anacidity undoubtedly are due to rapid regurgitation of pancreatic fluid, which leads to a rapid decrease in gastric acidity, and hence to a more speedy emptying of the stomach.

If ulcers do occur in the absence of free acid (and to date it is questionable whether more than one case of this type in the literature is actually proved), what is the mechanism producing ulcer pain? There is no doubt that in many cases this pain is peristaltic in nature. Eusterman[5] in his case noted with a kymograph the peristaltic nature of the ulcer pain, yet aspiration of the stomach at the time of this pain gave no free acid. Smith, Paul and Fowler[10] have shown that the epigastric distress associated with an irritable colon is due to an increase in gastric tone and peristalsis, and in ulcer patients have produced their typical distress by inflation of the colon with air. This distress was proved to be due to increased gastric tone and peristalsis. However, in the majority of ulcer patients, it cannot be denied that the cause of their pain is an accumulation of free hydrochloric acid. This of course acts as an irritant and undoubtedly alters gastric tone and peristalsis. Palmer,[11] in another remarkable series of observations at Cook County Hospital, found that free acid is the usual irritant which causes ulcer distress. He produced the typical ulcer pain in ulcer patients by injections into one patient's stomach of gastric contents aspirated from another ulcer patient having pain, and by reinjection of gastric content into the stomach of a patient in whom its aspiration had brought relief. Such distress was not caused by injection of acid gastric contents into normal stomachs. Hydrochloric acid, sulphuric acid, acetic acid, and even sodium hydroxide were injected into the stomachs of ulcer patients and the typical pain produced. Neutralization or removal of these irritants relieved the pain. He found that in many patients with gastric carcinoma the typical distress was initiated and relieved in the same manner. He found no evidence of hyperesthesia of the normal gastric mucosa or of pain as the result of hyperchlorhydria with an intact gastric or duodenal mucosa. In a large series of ulcer patients at the Cook County Hospital in Chicago he found that spontaneous ulcer pain without free acid in the gastric content removed at the time of distress has been seen only once and that in a patient with a very sensitive pain-producing mechansim. To prove the value of neutralizing free acid the same author[12] later compared the value of treatment of two groups of ulcer patients at Cook County Hospital—one with hourly milk and cream and beef tea feedings, and one with hourly milk and cream feedings and alkalies in addition. Neutralization of the free acid by alkalies, used in conjunction with the hourly milk and cream feedings, definitely favored the healing process. This was indicated both by the earlier disappearance of spontaneous pain and by the earlier disappearance of sensitivity to injections of free hydrochloric acid. The recent attempt to substitute mucin for the alkalies in ulcer management, as reported by Fogelson,[13] further bears out the importance of free acid in ulcer management. This is still in an experimental stage but apparently may be a very useful measure. We have had no experience with its use.

Because of its bearing on the two case reports submitted below, the writers wish to digress somewhat and briefly consider the present-day views on the relationship of gastric ulcer to gastric carcinoma. Surely the finding of low gastric acid values with a gastric lesion in a patient who once had a high free acid and an ulcer demands investigation. However, as will be shown below, such a finding does not necessarily have much weight in deciding that a lesion is a malignant ulcer. Authorities are rapidly abandoning the still very prevalent idea that gastric ulcers are potential carcinomas and therefore are not to be treated by medical management. Cole[14] quotes Mayo as once making the statement that gastric ulcers over 2 cm. in diameter are malignant in 68 per cent of the cases. Cole points out that these large ulcers form only 10 per cent of all gastric ulcers. Therefore on Mayo's figures, 6.8 per cent of gastric ulcers are carcinomatous. Cole states that 6 per cent of gastric ulcers are or become malignant. He feels that repeated X-ray examinations of a gastric ulcer on treatment, at bed rest, are as decisive in ruling out carcinoma as are palpation by the surgeon at operation or even the microscopic examination of the tissue. Warthin in an address made in Minneapolis in 1929 emphasized the impression that carcinoma of the stomach is no more prevalent with or following gastric ulcer than it is in the general population not having ulcer. Emery[4] in his series (quoted previously) found that only 4.4 per cent of his gastric ulcer patients developed carcinoma after an average follow-up period of four and one-half years. The average duration of symptoms in these patients had been nine years, thus giving a total average observation period of thirteen and one-half years. Brown[3] in his report of 1,224 cases of ulcer had seventy-seven gastric ulcer patients. Of these, nine had died and in eight the cause of death was known. Only one died of carcinoma of the stomach. Bockus in discussing this report[3] stated that his experience as concerned the questionable relationship of gastric ulcer to gastric carcinoma was the same as that of Brown.

CASE REPORTS

Case 1.—C. A. D., a minister, aged sixty-three years, was first seen at the Earl Clinic by one of us (G. E.) in October, 1927, with the complaints of loss of strength and vitality, sleeplessness, loss of appetite, and nervousness. No nausea or vomiting had occurred. His family history and previous medical and surgical histories were irrelevant. The physical examination is recorded as showing normal pupillary and patellar reflexes, a soft systolic murmur at the apex which was not transmitted, and essentially normal lung findings. There was slight tenderness elicited in the gallbladder region. The abdomen was mildly distended. Some varicose veins of the left leg were noted. Laboratory reports gave his hemoglobin as 74 per cent, urine normal, temperature normal, pulse 78, blood pressure 112/78, and his weight 123. An Ewald test meal at 1 hour showed free acid 0, total acid 10. An X-ray of the stomach revealed a normal stomach with no retention of the six hour barium meal, and a large saccular duodenum with a deformity very suggestive of duodenal ulcer. There was retraction laterally of the second portion of the duodenum suggesting galbladder adhesions. The tonsils were chronically infected and were removed. The other treatment advised was a frequent feeding schedule, including liberal amounts of milk, cod liver oil, and olive oil as tolerated. He was given dilute hydrochloric acid and essence of pepsin.

The patient was not seen again until April 4, 1931. Meanwhile he had been examined at the Mayo Clinic in September, 1929. There also a duodenal deformity was found on X-ray. His gastric analysis (fractional probably) showed a free acid of 12, with a total acid of 20 to 32. It was felt at that Clinic that the patient's symptoms were only in part, if at all, caused by an active ulcer, and that worry and care were responsible for his symptoms. He was advised to follow a bland, high-vitamin, high-caloric, anti-constipation diet and was given belladonna, bromides and charcoal after meals. Calcium carbonate was to be used one hour after each meal.

When seen here in April, 1931, he stated that his symptoms were about the same as they had been in 1927. His distress was a dull ache near the navel at times, but usually a severe bloating and sense of heaviness in the epigastrium. This was never present before breakfast, but might precede the other meals and if so was aggravated by food taking. It might originate one to two hours after meals or at times immediately after meals, always disappearing if he could belch. No night pain. No vomiting nor acute colic nor jaundice. For the past week on the advice of his family physician he had been on an hourly alternation of milk and alkalies with considerable relief. His bowels had been functioning normally. No tarry stools. His appetite was poor. His strength had been poor, especially since an attack of "flu" five months previously. He had eaten no meat for three or four months. Worry always aggravated his distress.

The physical examination revealed a rather undernourished white male of 67, weighing 116 pounds. Pupillary and other reflexes were normal. Heart and lungs and thyroid appeared normal. Tenderness was present to a moderate degree in the mid-epigastrium and very slight rigidity of the upper right rectus muscle was noted. No edema of the ankles was seen. Rectal examination yielded nothing of importance.

Laboratory Data: Hemoglobin 82 per cent., R. B. C. 3,940,000, W. B. C. 8,200. Urine showed 1 plus albumin, no sugar, occasional white cells, an occasional granular cast. Temperature 97.2, pulse 90. Blood pressure 108/75. A differential blood count was normal. The smear showed no changes of a pernicious anemia type. A one-hour Ewald yielded no returns, so the test was repeated and aspiration done at thirty minutes. This showed free acid 0. Total acid could not be titrated due to the small volume obtained. A stool specimen contained no occult blood.

The patient had to go to Chicago for about ten days before the examination was complete. He was given belladonna and bromide for an assumed spastic colon, and the usual spastic constipation diet instructions. He was also told to use 30 drops of dilute HCl with each meal and a half hour after meals.

On his return he stated that he had felt fine on this management. Another Ewald was done. At one hour the free acid was 0, total acid 9 (25 c.c. of material aspirated). A trace of occult blood was detected in this specimen. Two stools both showed a small amount of occult blood. A fractional gastric analysis was done after injecting 0.6 mgm. of histamine. The results of this in terms of points of free acid at 15, 30, 45, and 60 minutes respectively were: a trace, 13, 15, 16 points. Occult blood was very prominent in these specimens. The patient had no bleeding from the gums, but possibly a small amount from hemorrhoids. A sigmoidoscopic examination revealed no pathology. A few days later four stools showed no occult blood.

X-rays: An X-ray of the gallbladder by the oral Graham-Cole method gave a normal picture. At fluoroscopy of the stomach, Dr. J. R. Aurelius detected, high on the lesser curvature of the stomach at the junction of the upper and middle thirds on the anterior wall, a fleck, 0.5 cm. in diameter, of a small penetrating gastric ulcer. Very slight induration was indicated and very little distortion of the rugæ. No spasm nor hyperperistalsis was noted. The old duodenal deformity was again seen but no evidence of an active ulcer was suggested there. Re-ray of the stomach two days later confirmed this finding. It was depicted on one of the films taken. A colon X-ray was negative for pathology. Marked hypertrophic arthritis of the lumbar spine was seen on these films.

After careful consideration of the various aspects of this case, an operation and resection of this lesion was advised and done by one of us (G. E.) on May 8, 1931. At operation a small, indurated, partially healed ulcer with a shallow crater, 4 mm. in diameter, and with a zone of induration of 1.5 cm. diameter was found at the site shown in the X-ray. No evidence of metastases in the glands or liver was found. Simple excision of this ulcer was done. The patient made an uneventful recovery except for some painful induration in the thighs, produced by the hypodermoclysis, which prolonged his convalescence. He left the hospital in five weeks and three days. To the present date he has been on a Sippy medical management for ulcer as a post-operative measure. A recent letter from him reveals a satisfactory result. The microscopic sections of this ulcer gave no evidence of malignancy.

Case 2.—P. S., aged forty-eight years, white male, whose occupation was dishwashing, entered Ancker hospital April 26, 1931. Seven years previous he had had an operation for ulcer, the nature of which could not be ascertained. The patient apparently had symptoms of an acute perforation and thinks a gastro-enterostomy was done. His present symptoms developed three years before and consisted of localized epigastric pain just to the left of the mid-line. This pain was relieved by food, soda (1 teaspoonful) or vomiting. For a month prior to admission he had been vomiting about one hour after meals. Some dark blood had been seen in the vomitus. Tarry stools had been noted for one week. Some night pain was present till about 2 a. m. He had lost 15 pounds in the past month.

Physical examination revealed nothing of importance in the head, neck, or thorax except a few coarse moist râles near the hilus of each lung posteriorly. These disappeared after coughing. His abdomen had an upper right rectus operative scar. Very slight epigastric tenderness was present.

The stomach was inflated with carbon dioxide (tartaric acid and soda) and no visible peristaltic waves were seen during a 20 minute period.

Laboratory Data: Blood pressure 100/70. Hemoglobin 94 per cent. Red blood cell count 4,930,000. White blood cell count 7,250. A differential count and smear were normal. The blood Wassermann was negative. A one-hour Ewald meal yielded no free hydrochloric acid and a total acid of 9. The volume of fluid aspirated was 200 c.c. No occult blood was present. One stool showed occult blood but many successive stools were free of occult blood. A histamine injection with a fractional gastric analysis yielded a good output of free hydrochloric acid (up to 32 points of free acid and 59 of total) in a one-hour period.

X-ray: Fluoroscopy of the stomach by Dr. J. R. Aurelius revealed a large penetrating gastric ulcer (3 × 2 cm.) on the lesser curvature and posterior wall of the middle third. There was also a duodenal deformity with spasm and a suggestion of a fleck ulcer being present. No evidence of a gastro-enterostomy was seen.

The patient was placed on a careful Sippy management with test aspirations periodically one-half hour after a dose of alkali and also at bedtime to be sure of effective neutralization of acidity and of emptying of the stomach. One such aspiration of the stomach one-half hour after a dose of alkali revealed free acid of 14 and total acid of 84. The hourly dose of calcium carbonate was promptly increased and successive aspirations yielded no free acid.

X-ray one month later (fluoroscopy and films) revealed, "now only the slightest evidence of the previous ulcer on the lesser curvature, showing marked improvement since the last examination. The duodenal cap remains deformed. There is now no evidence of ulcer crater and only slight spasm present in the cap. There is, however, a rather definite point of tenderness over the duodenal cap" (report again by Dr. J. R. Aurelius).

The patient was discharged from the hospital June 6, 1931, to carry on ambulatory medical management for his two ulcers, and to report back to the out-patient department of Ancker Hospital.

DISCUSSION

The advisability of resorting to surgery in Case 1 may be questioned, since medical treatment of gastric ulcer is now being chosen by the most careful authorities in preference to surgery, particularly when the ulcer is not adjacent to the outlet of the stomach. Our main reason for advising surgery was that our patient was a man of 67 years with a small gastric lesion which had developed since he was last seen here in 1927, in the face of a very low gastric acidity, approaching an achlorhydria. We felt that his symptoms were entirely due to a spastic colon which he had obviously possessed four years previously and these symptoms were not changed by the development of the ulcer. Therefore, a symptomless gastric lesion appearing in the face of a known very low acidity was our chief reason for advising operation and excision of the ulcer. It was felt that if it was carcinoma an operative cure was assured. We were not influenced by a fear that this ulcer might develop into a carcinoma (for the lack of a good basis for this idea has already been pointed out), but we believed that this might actually be a carcinoma, due to the circumstances surrounding its development. The occult blood reactions in the stool were suggestive of carcinoma at first but later the stools were free of blood. Another reason for advising surgery was that this stomach was of a long, vertical fishhook type, with rapid emptying (so much so that even in 30 minutes an Ewald meal was recovered only once in three trials), and the ulcer was high up on the lesser curvature. We felt that in the absence of a high acidity and with the rapid emptying the usual form of medical treatment, which has as its basis neutralization of free acid, was unlikely to be highly successful for our fluoroscopy showed the impossibility of keeping the milk or alkalies in contact with this ulcer.

In passing, we wish to emphasize the technic used by Dr. Aurelius in finding this very insignificant fleck by fluoroscopy. There is no question that if, as usually is done by X-ray men, the stomach had been filled with barium, this lesion would have been missed, but by having the patient take only one swallow of barium and watching it pass over the rugæ slowly, combined with careful palpation, Dr. Aurelius detected this tiny fleck, about 0.5 cm. in diameter, on the anterior wall just off the lesser curvature at the junction of the upper and middle thirds of the stomach.

Case 2 illustrates, as does Case 1, the value of histamine in eliciting a flow of free acid when Ewald meals showed an achlorhydria. Comfort and Osterberg[15] in a recent report from the Mayo Clinic question the advantages of histamine over an Ewald or fractional test, except in cases where a gastro-enterostomy or gastric resection allows alkaline regurgitated fluids to mask the output of free acid. They state that the advantages of histamine over the Ewald are not great enough to warrant the adoption of stimulation by histamine as a routine procedure. These authors also cite cases of gastric carcinoma having as great a concentration and volume of free hydrochloric acid as those obtained in duodenal ulcer. In our experience we have found histamine stimulation to be an invaluable aid in separating apparent from true achlorhydria. The dose used is 0.1 mgm. of histamine subcutaneously for each 10 kilos of body weight of the patient.

Another valuable aid in the analysis of apparent achlorhydria in ulcer patients is the therapeutic aspiration, *i.e.,* aspiration of gastric contents at a time when the patient complains of pain. If this had been done more frequently, the literature relating to achlorhydria in ulcer patients would be very nearly negligible. Our second patient who showed no free acid with an Ewald meal not only had a good output of free acid with histamine stimulation but also showed free acid in good concentration in one test aspiration (one half hour after a dose of alkali) which aspirations are routine on our service in ulcer cases. Aspiration for free acid three hours after a Riegel meal or four hours after an ordinary meal will usually show a high acid concentration in ulcer patients though the test meals show achlorhydria.

It must be emphasized that gastric contents containing food must be titrated immediately and cannot be allowed to stand overnight if the true free acid values are desired. Otherwise the free acid is changed to combined acid.

Finally, the importance of routine stool examinations for occult blood is not to be overlooked. Finding occult blood, of course, may be compatible with either ulcer or carcinoma, but the absence of occult blood, using the benzidine test, in repeated stool examinations, rules out the presence of carcinoma with as great an accuracy as is offered by X-ray. In our Case 1 both the X-ray and the stool examinations pointed to the absence of carcinoma, yet we feared it because of the hypochlorhydria which was known to have been present for at least four years. Our fears were unfounded. In our Case 2 the absence of occult blood in repeated stool examinations absolutely confirmed the X-ray diagnosis that this large lesion on the lesser curvature was a benign penetrating ulcer. Any malignant lesion of that size will continue to show 4 plus occult blood reactions in the stools.

The rapid disappearance of the huge penetrating lesion as shown by repeated X-ray studies in Case 2 is typical of the very satisfactory results of medical treatment of gastric ulcers in general, if uncomplicated by pyloric obstruction.

SUMMARY

Literature is cited to show the confusion that exists regarding the coincidence of peptic ulcer and achlorhydria and to prove that, with only one or two exceptions, cases reported to show such a coincidence have been insufficiently studied and are unproved. Two case reports are included showing gastric ulcers with apparent achlorhydria but in which more careful study revealed an adequate free acid concentration compatible with peptic ulcer. The methods available in the study of gastric acidity in ulcer are discussed. The importance of routine stool examinations in the diagnosis of ulcer and gastric carcinoma is emphasized.

CONCLUSIONS

1. An active peptic ulcer in the presence of true gastric achlorhydria is so rare as to be negligible.
2. Histamine stimulation of gastric secretion should always be tried before diagnosing achlorhydria, or even hypochlorhydria, where peptic ulcer is suspected. In our experience it has caused free acid to appear frequently where the ordinary test meals showed achlorhydria.
3. Aspirations of the stomach at the time of suspected ulcer distress, or four hours after a heavy meal or Riegel meal, should be resorted to if an Ewald shows no free acid. Failure to use all of these useful procedures is responsible for nearly all the reported and erroneous diagnoses of achlorhydria associated with peptic ulcer.

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PEPTIC ULCER: A REVIEW OF RECENT OPINIONS OF ETIOLOGY AND TREATMENT*

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MANY American clinicians are inclined to subscribe to the theory that the typical callous peptic ulcer forms from acute lesions or erosions, which are rendered chronic by their position and the action of the gastric juice. Numerous ideas with regard to the formation of acute lesions have been advanced; it has been suggested that they may be of vascular, traumatic, or infectious origin. The vascular theory, first suggested by Virchow, is supported by the work of numerous investgators who have demonstrated lesions in the gastric arteries. More recently von Bergmann has suggested that spasmodic contraction of the afferent vessels of the stomach may be responsible for localized destruction of the mucosa.

The researches of Ivy,[8,14] McCann and other investigators indicate the relation of trauma to the development and healing of ulcer. Undoubtedly, the gastric and duodenal mucosa is often injured from coarse particles of food, hot or cold beverages, vomiting, external pressure and chemical irritants. Such lesions are probably not confined to any one area in the stomach; from what is known of gastric mechanics, they should be most common along the lesser curvature, in the pyloric antrum, and in the duodenum, regions of the stomach which constitute the so-called Magenstrasse or gastric groove.

Many infectious processes have been known to cause acute gastric ulceration or erosion, and it is a matter of general clinical observation that reactivation of duodenal ulcer often follows infection of the upper part of the respiratory tract or interference with oral foci. The work of Rosenow, in 1913, called attention to the significance of distant foci of infection. Streptococci isolated from such foci produced gastric lesions ranging from hemorrhagic areas to superficial erosions in experimental animals. Such lesions may well furnish the original mucosal defect from which a chronic ulcer is formed by traumatic, chemical, and constitutional factors.

It is probable that acute gastric or duodenal lesions of one kind or another must be fairly common, and that they usually heal without producing symptoms. The knowledge of what determines the course of such lesions, and why some heal whereas others become chronic and intractable, would probably settle many disputed questions with regard to ulcer. The position of the lesions is, of course, significant; those which lie in the gastric groove are subjected to additional chemical or mechnical trauma and may readily become chronic. This "mechanical functional hypothesis" for which we are indebted to Bolton and to Aschoff, cannot be overlooked in any consideration of the etiology of ulcer.

Constitutional factors, perhaps, deserve the next consideration. It is generally recognized that such conditions as an ulcer diathesis and ulcer disposition exist, but on what factors these are based has not been explained. Draper's data suggested a certain similarity in anthropometric measurements in cases of ulcer, as contrasted, for example, with cases of cholecystitis. Various writers have suggested a vagotonic constitution as a prerequisite to the development of ulcer; others have suggested a sort of spasmophilic diathesis as a basis. Winkelstein advanced the idea that patients with peptic ulcer are more sensitive to a variety of physical and pharmacologic stimuli than normal persons. Hypotheses of the constitutional basis of ulcer presuppose to a greater or less extent abnormal reactivity of gastric secretion and motility to psychic and emotional stimuli as well as to the stimulus of ingested food. Clinically there is much to support this view, since reactivation of symptoms of ulcer under emotional stress is common. Recent studies on gastric innervation are of interest in this connection, since any constitutional tendency to ulcer might well be associated with functional abnormalities of nervous connections.

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Hartzell found that after section of the vagi of dogs there was a reduction in the amount and the acidity of gastric secretion, and that the psychic variations in secretion were practically abolished. After section of the splanchnic nerves, Vanzant found little change in the reaction of gastric secretion to various stimuli; she also checked data concerning Hartzell's original animals and found that two years after vagotomy the normal secretory activity was restored. Animals with completely denervated stomachs also exhibited an essentially normal response, although the flow of gastric juice after a meal of meat or an injection of histamine was distinctly slower and of a less magnitude than before operation. Such results can only be interpreted to show that the stomach has a high degree of automaticity in respect to both its motor and secretory functions, and that its nerve connections do not control all of the various processes which may underlie gastroduodenal ulceration.

Chemical factors in the production of ulcer have been regarded as of great significance since the corrosive action of gastric juice was first demonstrated; in fact, the presence of free hydrochloric acid in gastric secretion is a sort of *sine qua non* in ulcer. It has been generally held that secretions of the stomach have no effect on normal gastric or duodenal mucosa if the blood supply is adequate. The recent experiments of Overgaard, who was able to produce pyloric gastritis with superficial erosions by giving repeated injections of histamine to fasting dogs, bring this older view into question. However, many normal persons have a more or less continuous hyperacid secretion, but do not have demonstrable ulcer. It has been stated that there is a protective mechanism which may fail and thereby favor the development of ulcer, but definite proof of this is not available. Mucin, which is one of the recognized physiologic antacid substances, is likely to be present in gastric secretion roughly in an inverse proportion to the height of acidity. Another protective factor, the normal alkalinity of the duodenal secretions, may be still more essential. Mann and Williamson, by diverting the biliary and pancreatic secretions into the ileum and connecting the jejunum directly with the stomach, produced chronic indurated jejunal ulcers with great uniformity. Bollman noted similar ulcers in experimental obstructive jaundice. Apparently the neutralization of gastric acid by the duodenal juices, bile and mucin is a protective mechanism which usually prevents corrosive action. Why such protective mechanism fails in the presence of ulcer is still unexplained.

American views on the genesis of ulcer have been well stated by Crohn; his statement may be paraphrased here. He assumes that ulcer occurs in young subjects of vagotonic habitus, whose gastroduodenal mucosa is rendered vulnerable by vascular spasm, infection, or trauma, and has been digested by the corrosive action of the gastric juice. If the erosion occurs in the gastric groove it is rendered chronic by its situation and consequent exposure to mechanical and chemical irritation. Secondary factors such as vascular occlusion, focal infection, and motor dysfunction then tend to perpetuate the lesion. In chronic ulcer, motor disturbances are undoubtedly of the greatest significance. Pyloric obstruction, even if temporary, tends to delay the healing of experimental peptic ulcers; pylorospasm is probably responsible for most of the daily pain and discomfort of the patient with ulcer; and, finally, all successful surgical procedures for the cure of ulcer involve either the division or removal of the pyloric sphincter, or else render it functionally useless. The pylorus forms the mixing valve arrangement by which the reaction of the gastric content is regulated in the region of the stomach most subject to ulceration. More information regarding the pathologic physiology of this important structure would furnish many additional clues to the cause of ulcer and means whereby it might be cured.

At present, the hypothesis of German observers on the etiology and nature of ulcer forms a decided contrast to those held in this country. Constitutional factors are of course regarded as important, and the "mechanical functional hypothesis" is given credence. Views on the relation of gastritis and duodenitis to ulcer, however, exert the greatest influence on ideas of treatment. Konjetzny and others assert that all gastroduodenal ulceration is accompanied by gastritis and duodenitis which may take the form of submucosal infiltration, simple erosion, or superficial, but nevertheless chronic, ulceration. German pathologists and surgeons have presented a great deal of evidence in support of this view, and their claims cannot be easily dismissed. During a recent visit to German surgical clinics, I had the opportunity of seeing a large number of specimens of resected stomachs. In most of them gastritis, duodenitis, and multiple superficial ulcerations were definitely present; in other specimens, the diffuse inflammatory process was less definite. American observers have not been impressed by the relation of gastritis to ulcer, although it is generally agreed that ulceration in either stomach or duodenum may be and often is accompanied by local inflammation. Judd, Nagel and Rivers described the clinical syndrome and the pathologic pictures of duodenitis, gastritis, and gastrojejunitis. Unfortunately, the syndrome of associated ulcer and gastritis is difficult to establish. Most of the evidence now available has been observed in pathologic specimens, and at operation. There is no characteristic change in secretory activity in gastritis. Roentgen-ray diagnosis of the condition is extremely difficult and only gastroscopy can establish the diagnosis unless operation is performed. Gastritis is probably worthy of greater attention than it has hitherto received, particularly from the standpoint of diagnosis in the intact individual. In Germany students of the subject have a distinct advantage because of the frequent use of the gastroscope and the practice of doing extensive gastric resections for all types of peptic ulceration, which furnishes much fresh pathologic material for study. Those who are advocates of the theory of gastritis naturally favor resection as essential to cure. It is obvious that any marked degree of this condition precludes to some extent successful medical treatment and also favors the development of recurrent or anastomotic ulceration when conservative surgical measures are practiced.

TREATMENT

In the United States the value of the Sippy treatment or some modification of it in selected cases, particularly in those in which ulcers have recently formed, is generally conceded. Hospitalization of the patient is necessary, and rigid control of the gastric acidity must be carried out if the best results are to be obtained. If lesions are chronic, treatment, even under the best possible conditions, will not yield as high a percentage of permanent medical cures as one might wish. Many patients with chronic duodenal ulcer are unwilling to submit to rigid medical treatment, and some ambulatory form of treatment must be devised. Curiously enough, ambulatory treatment has a fairly good record in the treatment of peptic ulcer. Blackford and Bowers have shown that with ambulatory treatment the end-results are practically as good as if patients have had the benefit of thorough hospital treatment. Recently, some new forms of medical treatment have been suggested. The work of Fogelson on the use of gastric mucin has attracted much attention, but it is still too early to evaluate results. Symptomatic relief has been obtained in many cases, but in some cases of long standing the results have been less satisfactory. Specific vaccines have been employed with variable results, but in general this type of treatment is not greatly favored in the United States. The use of nonspecific vaccines, which was originally advocated in Germany, seems to have been largely abandoned by clinicans there. The method of treatment has been used at The Mayo Clinic in the treatment of recurrent ulcer with somewhat disappointing results. Often gastric acidity is reduced for a matter of twenty-four hours following the administration of typhoid vaccine, and during this period there may be definite relief of pain. Only in the occasional case have the results been sufficiently permanent to encourage further trial of the treatment.

American statistics as to the percentage of medical cures of duodenal ulcer vary greatly, as do percentages on mortality in cases in which operation is not performed. Cures have been claimed in 80 per cent of cases; more conservative figures are as low as 20 per cent. The results to be expected from medical treatment vary greatly with age and sex, duration of the ulcer, and the patient's economic condition. The asserted permanency of the cure depends to a great extent on the length of time a given case is followed. Symptomatic relief is easy to obtain, but permanent and complete cure is an entirely different matter. It must not be forgotten that spontaneous cures do occur. According to Stewart, about 12 per cent of subjects coming to necropsy present evidence of past or present ulceration of the stomach; Robertson and Hargis' figures are considerably higher (20 per cent). Symptoms of ulcer are not present in all of these cases; in many, only brief atypical periods of indigestion are known to have occurred. Usually only the most cursory treatment has been given, nevertheless at necropsy a considerable percentage of the lesions is completely healed. These facts must be considered in the evaluation of any form of treatment.

Medical treatment of duodenal ulcer in European clinics is probably not practiced as extensively as in this country; economic difficulties are the principal objection to treatment of this type. Several popular forms of medical treatment are practiced in Germany, such as the Lenhartz diet with or without alkali; various types of bland food given with large amounts of dextrose and belladonna to the point of tolerance, and the Sippy treatment or some modification of it. In some central European clinics a sugar cure is used, on the basis that patients with ulcer suffer from chronic acidosis, as shown by increased tolerance to alkalis. Insulin was originally used in this treatment, but at present large doses of sugar by mouth are employed to compel the patient to manufacture his own insulin. In one German clinic I visited jejunal feeding by means of a special tube was the method of choice. This involves retention of the tube for several weeks, and in spite of the incidental discomfort good temporary results are obtained. Many German physicians are rather pessimistic as to the permanence of the medical cure of ulcer, and I found it difficult to obtain entirely satisfactory data as to the end-results. A number of the internists took the view that it is necessary to produce radical change in gastric physiologic processes before permanent cure can be expected.

Surgical treatment of duodenal ulcer in America and in the British Isles has been confined largely to gastro-enterostomy or some form of pyloroplasty; gastrectomy is reserved as a rule for gastric ulcer or carcinoma. Statistics on the value of these conservative procedures collected over a period of years indicate that good results are obtained in approximately 90 per cent of cases. The surgical mortality varies with the experience of the operator, but in skilled hands it may be as low as 1 per cent. The rate of recurrence does not seem to be particularly high; the most accurate figures available indicate that it does not exceed 5 per cent. Gastrectomy has been advocated by certain groups of surgeons in this country largely as a means of avoiding recurrent or anastomotic ulcers. In one American institution in which partial gastrectomy for duodenal ulcer is widely practiced, associated gastritis and duodenitis is said to be common.

In many of the German, Austrian, and Hungarian clinics, and in one large clinic in Paris, gastrectomy is almost universally employed in the treatment of both duodenal and gastric ulcer. German surgeons in general state that the rate of recurrence of ulcer after conservative operation (gastro-enterostomy or pyloroplasty) varies between 10 and 35 per cent. This high rate may be due to the gastritis, duodenitis, and multiple ulcerations which are observed so frequently in these clinics; it may also be due to delayed surgical intervention. The average surgical mortality for subtotal gastrectomy is not less than 5 per cent; good permanent results are obtained in about 85 per cent of cases. The rate of recurrence of ulcer after subtotal gastrectomy is said to be about 1 per cent or less. However, the operation is not without drawbacks and some of its proponents admit that a fairly large group of patients appears to have a good deal of trouble in spite of extensive resection. Gastrogenic diarrhea, anemia, cholangeitis, and motor disturbances are the common causes of unsatisfactory results. Henning recently performed gastroscopy on a considerable number of patients who have continued to suffer with digestive disturbances following subtotal gastrectomy. He found that a high percentage of them had definite, visible gastritis which is persistent.

So far as the future of primary partial gastrectomy for duodenal ulcer in this country is concerned, it appears that it should be confined to individual cases in which marked diffuse gastroduodenitis or multiple ulcerations can be demonstrated. Unfortunately, such demonstration is not often possible except at the time of operation. If one were certain of detecting in advance the patient with a constitutional tendency to the formation of ulcer and therefore especially likely to recurrence, gastrectomy might be justifiable for this type also. It does not, however, seem entirely proper to use the admittedly high incidence of recurrence of ulcer in European clinics as an argument in favor of gastrectomy in this country, since there are probably pathologic variations as well as economic and dietary factors which may explain the variations observed.

SUMMARY

Many American students are inclined to regard gastroduodenal ulceration as the end-result of an acute lesion produced by trauma, infection, or vascular lesions, which has become chronic because of its position and the corrosive activity of the gastric juice. The process is regarded as essentially reversible and one which may be corrected by a proper dietary regimen, the control of gastric acidity, and removal of foci of infection, provided the psychic and environmental factors which may predispose to ulcer can also be regulated. In the intractable chronic case, in which economic and other handicaps and such complications as hemorrhage, obstruction, and penetration enter the picture, surgery, usually of a conservative type, is the procedure advocated.

In central European clinics, a high incidence of associated gastritis and duodenitis and a stated high rate of recurrence after conservative surgical procedures combine to make subtotal gastrectomy the preferred method of treatment. It is suggested that perhaps geographic, dietary, and environmental factors may be involved in these differences of opinion, and that a closer comparison of the pathologic changes of ulcer as it is observed in this country and in central Europe may help to reconcile the advocates of radical and conservative methods of treatment.

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CONVULSIONS IN CHILDHOOD*

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A CONVULSION is one of the most alarming symptoms which can occur to a child. To the parents it signifies an impending catastrophe and to the physician, unless he recognizes epilepsy, the symptom presents an acute problem for treatment and diagnosis. While a convulsion is usually not fatal, it always produces a certain amount of cerebral damage which lowers the threshold for subsequent attacks; therefore immediately succeeding the problem of the control of the acute attack comes the question of a differential diagnosis. Every effort must be made to determine the basic cause of the symptom, convulsive state, and to prevent a recurrence. In this paper a convulsion is interpreted as a series of involuntary contractions of a group or of several groups of muscles usually associated with a loss of consciousness or cerebral function.

I have made a study of 400 children who have been brought to the Milwaukee Children's Hospital in the past five years for the treatment of acute convulsions. The ages of the patients range from an hour to fifteen years. Many were brought in during or shortly after a convulsion. It will be realized that with the attendant excitement and confusion and the unavoidable delay the physician often arrives at the home or the patient at the hospital after the convulsion is over.

In each case every possible effort was made by clinical and laboratory examinations to make a diagnosis. This includes as complete a history as obtainable, a complete physical (and neurological) examination, examination of the fundi, urinalysis, spinal fluid examination, X-ray of the skull, and determinations of the blood Ca, P, N, blood culture, etc., somewhat in the respective sequence. Some patients were seen only once and for a short time, often making a diagnosis impossible.

On the basis of this study a classification of convulsions is presented according to age groups (Tables 1, 2, 3, 4). This classification has been found to be the most convenient for clinical purposes. It will be noted that the most common cause of convulsions in the newborn infants is cerebral injury (hemorrhage, congestion, or edema). The premature infant is most susceptible because of his soft bones, ununited sutures, widely open fontanel, and fragile vessels. Long labors, or rapid precipitate deliveries, breech deliveries, or instrumental deliveries are predisposing factors but often there is a history of a normal labor and delivery.

There is a period between the first few weeks of life and approximately eight months when convulsions are relatively infrequent. The explantation is obvious: the immediate results of birth injury are passed, tetany is not yet present, and the acute infectious diseases do not occur.

TABLE 1.—NEWBORN INFANTS AND FIRST MONTH

1. *Cerebral Injury.*
   - Hemorrhage.
     - Subtentorial
     - Subpial
     - Ventricular
   - Compression.
     - Congestion
     - Anemia
2. *Septicemia.*
   - Nasopharynx.
   - Umbilicus.
   - Skin Infections.
3. *Congenital Anomalies.*
   - Hydrocephalus.

TABLE 2.—FIRST TO EIGHTH MONTH

1. Residue of Birth Injury.
2. Septicemia, Onset Acute Infections.
3. Congenital Anomalies.
4. Toxic: Poisons, Terminal.

TABLE 3.—EIGHT TO THIRTY-SIX MONTHS

1. Spasmophilia or Tetany.
2. Septicemia, Including Onset of Acute Infections as Pneumonia, Meningitis, etc., and the Onset of the Acute Infectious Diseases.
3. Residue of Birth Injury.
   - Hydrocephalus.
   - Congenital Anomalies.
   - Syphilis.
   - Epilepsy.
   - Cerebral Hemorrhage.
   - Serous Meningitis.
   - Brain Tumor or Cyst.
   - Toxic: Intestinal Obstruction, etc.

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*From the Department of Pediatrics, Marquette University, and The Milwaukee Children's Hospital. Read before the annual meeting of the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

TABLE 4.—THREE TO FOURTEEN YEARS

1. Residue of Birth Injury.
2. Septicemia Including Onset Infections and Infectious Diseases.
3. Epilepsy.
4. Spasmophilia.
5. Chronic Encephalitis, or Encephalitis or Meningitis Residue.
6. Brain Tumor or Cyst.
7. Hydrocephalus.
8. Toxic, etc.

The most common causes left are the residues of birth injury and the onset of acute infections or septicemia.

From eight to thirty-six months of age, spasmophilia dominates the picture as the cause of convulsions, closely followed in frequency by the onset of the acute infectious diseases. Tetany occurs in the rachitic infant usually in the spring and fall.

After three years the onset of acute infections and the infectious diseases are the important factors, followed by the residues of birth injury, epilepsy, etc.

Most convulsions are the immediate result of cerebral edema. This may not necessarily be expressed in an increase of the spinal fluid pressure. The fluid may be held bound in the brain cells. The convulsions of the acute septicemias and of epilepsy are usually associated with a polynuclear leukocytosis.

Treatment.—The immediate treatment of most convulsions is the treatment of cerebral edema.

Two to 6 ounces of a saturated solution (50 per cent) of magnesium sulphate should be given by mouth, if possible, or by rectum following an enema. A 10 per cent solution of glucose or of sodium chloride intravenously will produce the same hypertonic effect. For quicker action 5 to 20 c.c. of a 10 per cent solution of magnesium sulphate may be injected intravenously (slowly) or intramuscularly.

If the child is seen in acute convulsions in the home and facilities are limited, chloroform anesthesia offers a quick and effective method of treatment which is easily administered. Ether is a second choice.

TABLE 5.—TREATMENT OF CONVULSIONS

1. Protect Against Injury.
2. Chloroform or Ether Anesthesia.
3. Saturated Solution of 25 per cent Magnesium Sulphate, 4 ounces by Rectum or by Mouth; or and, 2 to 5 c.c. of 2 to 10 per cent Solution Intravenously, or 5 to 10 c.c. Intramuscularly.
4. Spinal Puncture If No Brain Tumor.
5. Chloral by Rectum.
6. Phenobarbital by Mouth or Soluble Barbituric Acid Preparations Hypodermically.
7. Treat Basic Disease.

Spinal fluid drainage is indicated as a therapeutic and diagnostic measure as soon as it can be done. A possible brain tumor, of course, demands caution in the withdrawal of fluid.

Sodium-phenobarbital and other new soluble barbituric acid compounds may be injected intramuscularly. Sodium amytal (Lilly's special preparation for intravenous injection) may be injected intravenously, 1.5 mg. per kilo body weight, if the child is quiet enough to permit it. This drug has been effective in two cases in which all of the above procedures were futile.

After the immediate treatment of the convulsion the basic disease should be given attention.

Conclusions.—The most important factor in a consideration of convulsions is the differential diagnosis. A convulsion is only a symptom and is usually due to cerebral edema. The immediate treatment of the convulsion is the treatment of cerebral edema.

NORMAL AND ABNORMAL MOTILITY SYNDROMES OF THE UPPER URINARY TRACT, WITH INDICATIONS FOR DRUG AND SYMPATHECTOMY THERAPY*

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A LARGE proportion of medical investigation and effort in the field of the physiology of the kidney has heretofore been mostly confined to observations on the secretory function. Very recently investigations have delved into the dynamic or motility side of the renal and ureteral physiology and at present I feel we are just on the threshold of many valuable developments in this field.

When one considers that adequate drainage of the urinary tract is of such extreme importance in infections of the kidney, renal sufficiency and calculus formation, we must conclude that we have been rather lax in our investigation and observation along this line.

The influence of the central nervous system on the secretory function of the kidney has long been a subject of research endeavor. Claude Bernard, way back in 1859, observed that cutting the splanchnic nerves in the dog resulted in an increase in the amount of urine secreted by the kidney. Since that time there have been numerous reports of experimental work done in this field.

At present it is generally accepted that the secretory function of the kidney is controlled by the vasomotor action of the sympathetic nerves. We now know that the entire nerve supply to the kidney may be interrupted in either one or both kidneys in the human without any untoward effect. Not only is there no untoward effect, but we know that the volume of urine secreted is increased about 25 per cent, with a relative decrease in concentration and an actual increase in the total amount of solids secreted.

I mention this to relieve any anxiety about any damage to renal function resulting from renal sympathectomy which may be contemplated to relieve painful renal syndromes which will be described at greater length later on. Heretofore, patients with such conditions as renalgia or nephralgia, painful nephroptosis, and various painful conditions calling for plastic operations, have been operated upon with rather inaccurate theoretical indications.

This brings up the question of a recent aid in the way of investigation of the upper urinary tract physiology as regards the motility. Manges has visualized the renal pelvis fluoroscopically since 1912 mainly for the purpose of insuring satisfactory filling of the renal pelvis or ureter before taking pyeloureterograms. Recently a number of investigators have made further detailed observations by this method. Jona and Flecker last July reported some observations on the action of atropin, morphin, eserine, pituitrin and ergot on the motility of the renal pelvis and ureter by direct fluoroscopic observation. They found that atropin resulted in definite relaxation and distention of the renal pelvis even to the extent of producing pain, which pain in turn was relieved by the administration of eserine. They observed that morphin, eserine, pituitrin and ergot all definitely stimulated the motility.

Shortly after this Harris and Harris reported their observations on a series of 28 patients in whom they had done renal sympathectomy for painful abnormal renal motility syndromes, with 100 per cent satisfactory relief. They made their diagnosis of what they called renal sympatheticotonus by the fluoroscopic demonstration of spasm in any portion of the renal pelvis accompanied by delayed emptying time, reproduction of the pain by over-distention, and symptomatic relief of the pain by the administration of eserine. Of particular interest was their report of one case of chronic glomerular nephritis which was not doing well under medical management but definitely improved a year after renal sympathectomy on each kidney with a three months' interval between operations.

The above contributions have been the basis of the observations that I have made and which I am interested in reporting today.

Slides were shown illustrating (1) the nerve supply to the kidney with its anatomical relations in the region of the renal pedicle and pelvis; (2) the normal mechanism of the renal pelvis and ureter; (3) abnormal mechanisms of the renal pelvis and ureter; (4) urograms illustrating various abnormal motility syndromes. The treatment of these cases was discussed and the results of the administration of eserine and renal sympathectomy were described.

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*Read before the annual meeting of the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

I feel very strongly that in the past countless patients with painful abnormal motility syndromes have gone on without relief because of our inability to recognize them by the means of urological investigations then at hand.

SUMMARY

1. We have available a method of observation of the motility of the upper urinary tract which should prove to be a fertile field for further useful and productive work.

2. Abnormal motility syndromes, corresponding to pylorospasm, cardiospasm, hypermotility of the stomach, spastic colon, and auricular fibrillation, will be recognized as definite entities occurring in the urinary tract.

3. The operation of nephropexy most likely is successful or unsuccessful in relieving the renal pain according to the degree to which the sympathetic nerve supply to the kidney is interfered with during the operation.

4. The satisfactory results in pain relief in much of the plastic work that is now being done upon the kidney I believe in many instances to be due to interference with the central nervous system control on the motility of the upper urinary tract.

5. Renal sympatheticotonus, as described by Harris and Harris, seems to be a well-defined entity which may be relieved by eserine or renal sympathectomy.

6. There have been a few cases of painful ureteral motility syndromes which have been relieved by nerve-stripping of the ureter, as reported by some recent writers.

7. The field of renal sympathectomy for certain nephritic conditions is merely mentioned as being a field for future observation and work.

8. Reflex anuria in a case of ureteral lithiasis had been relieved by injection of the splanchnic nerves by the method of Kappis.

MALIGNANT CONDITIONS IN RADIOACTIVE PERSONS

In 1925, Martland reported cases of anemia and of necrosis of the jaw in persons who had been employed in painting watch dials with paint made luminous by the addition of radium, mesothorium and radiothorium. During several years previous to 1924, 800 girls did such work in a New Jersey factory. The girls swallowed small amounts of radioactive paint day after day as a result of pointing the brushes with the lips. Some who had worked for one or more years developed necrosis of the jaw and anemia, from which, up to 1928, thirteen died. Now, however, another pathologic condition seems to have arisen among the employees who swallowed radioactive paint. Since 1928, rapidly growing osteogenic sarcomas have appeared in at least eight cases. In consideration of recent developments the high incidence of primary carcinoma of the lungs in the cobalt miners of Schneeberg and in the pitchblende mines of Joachimstahl, and the various lesions produced by external exposure to radium and X-rays, demand investigation, and many of the radioactive substances sold to the public for the cure of various ailments may be dangerous to health. Testifying against the interstate sale of vials of mesothorium and radium which were to be injested after being dissolved in water, Martland reported that he had examined two patients who had taken such water from one to two years and found both to show radioactivity, and both had extensive necrosis of the upper jaw. Martland states that waters which contain only emanation are frauds and he doubts whether they are harmless. The drinking over long periods of time of radioactive waters containing radon, and the drinking of natural radioactive waters, should be discouraged. Martland likewise cautions against the intravenous injection of long lived radioactive elements. (Jour. A. M. A., December 26, 1931, p. 1968.)

CONSERVATION OF HEARING*

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THE extent of deafness affords an economic and sociologic problem of a magnitude not generally appreciated. Recent surveys place the number of school children in the United States with defective hearing at three million, and it is roughly estimated that from six to eight million of our entire population are afflicted by a loss of hearing acuity to a greater or less degree. This shows the incidence of six per cent of our people deafened to such a degree as to be hampered in their capacity to enjoy normal contact with their families and society, and also seriously handicapped in acquiring an education and making a living. This puts a heavy responsibility on society, and especially on the medical profession, in trying to remedy this as far as possible. Admittedly, the majority of these cases have only moderate impairment of hearing at first. This, however, may become aggravated and permanent if not cared for early. Otologists hold that by far the greater number of beginning cases of deafness are amenable to treatment, and it is therefore necessary that deafness be detected promptly, so that proper steps can be taken to prevent the condition from becoming chronic.

Due to its insidious onset, deafness, unlike visual and other defects, is not readily recognized, and may be overlooked for a long time by parents, teachers, and the medical profession. In preschool years, and in later life, it is harder to check up than during school years, which time offers the best opportunity for detecting and preventing deafness. Recognizing this, the Section of Otology of the American Medical Association in 1929 adopted the following resolution:

> "Whereas, Recognizing the fact that the most effective means for the prevention of deafness consists in the early detection of hearing impairment, thereby giving opportunity for the prompt removal of contributing causes, and believing it to be one of the important functions of our public school authorities to safeguard the integrity of the special sense organs, as well as the general health of the school child, be it
>
> Resolved, by the American Medical Association, that it heartily favors the provision by our public school authorities for regular periodic examinations of the hearing acuity of all public school children, such examinations to be adequate to detect even slight degrees of hearing loss."

Any satisfactory early detection in the very young is quite difficult and requires the coöperation of parents, general practitioner, the pediatrician, and the otologist. The evidence then is largely circumstantial. The backward and undeveloped child with nutritional disturbances, frequent colds, nasal discharge, adenoids, parasinus and throat affections, and cervical adenopathy, all tending to inflammatory ear involvement, invariably develops more or less loss of hearing acuity.

It will be seen that the care of the deafened child is not necessarily an ear problem, but rather one for the pediatrician. Sanitary, dietetic, and nutritional management underlies all preventive measures.

Various tests have been devised which record with more or less accuracy the kind and degree of loss: (1) conversational voice; (2) whispered voice; (3) watch; (4) forks (Weber, Schwabach, Rinne).

These tests, however, may be classed largely as qualitative tests, they are laborious, and only one person at a time can be checked up. As long as it is so difficult to detect hearing defects in preschool age, it is important that we make use of the opportunity offered in health examinations in schools when we have access to all of our future citizens, and at a time when preventive measures are still available and effective.

The audiometer, an instrument which enables one to test the hearing of groups of children, up to forty in number, is now available. This instrument was devised with the coöperation of the officers of the American Federation of Leagues for the Hard of Hearing, by the technical staff of the Bell Telephone Laboratories. This instrument makes a fairly stable and accurate record of the degree of deafness, and is the only method so far devised which is least influenced by outside interference and errors arising from the human factor of patient and examiner.

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*Presidential address read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

In classifying deafness, we must consider three main groups: (1) congenital deafness; (2) acquired conductive deafness; (3) acquired perceptive deafness.

The congenitally deaf do not come into the realm of this discussion; however, a recent report in the Journal of the American Medical Association by Shambaugh on the examination of 5,348 cases in schools for the deaf, gives the interesting data that 62 per cent are congenitally deaf, and of the acquired cases, 50 per cent developed before the age of three. Meningitis causes 20 per cent, measles 8.5 per cent, scarlet fever 7 per cent, influenza 7 per cent. The Wassermann test was positive in only two of 396 cases examined. There was a history of consanguinity in one-third of the cases; three-fifths of the cases had speech defects.

Acquired conductive deafness is the form usually found in early life, and offers the best prospects for amelioration and cure. It is the result of infections and catarrhal inflammations of the middle ear and mastoid, interfering with proper sound conduction to the labyrinth and auditory center.

External diseases and conditions like furunculosis, cerumen, and foreign bodies may cause temporary deafness by obstruction and myringitis. Acute and chronic catarrhal and purulent otitis are most frequent causes, especially when there is mastoid involvement. All these may result from naso-pharyngeal infections of various bacterial origin, through a chronic inflammatory process gaining entry by way of the eustachian tube. Chronic exudative or adhesive catarrhal middle ear involvements are more disastrous to hearing than the acute purulent and inflammatory kinds, because of the insidious and painless onset. Destructive changes of the conducting apparatus frequently go on unnoticed and unattended until serious permanent damage is done to the hearing. The acute fulminating and painful inflammations and suppurations go on to resolution more quickly, because they usually receive proper attention early.

Acquired nerve or perceptive deafness is more prevalent later in life, and is due to constitutional and toxic blood diseases, which do not affect children so often. Some inner ear or perceptive involvements are due to extension from middle ear suppuration, but usually they are idiopathic, the direct results of such conditions as meningitis, typhoid and scarlet fever, measles, diphtheria, influenza, mumps, nephritis, diabetes, syphilis, and focal infections in teeth and tonsils, whose toxins may be destructive to the auditory tract from labyrinth to center in brain. Head injuries are frequent causes of nerve deafness.

Then we have otosclerosis—the mysterious hearing involvement with progressive and permanent deafness, which is due to trophic disturbances and bone changes, possibly an endocrin disturbance.

The prevention of hearing loss requires the care of inflammatory processes of ears in children, adolescents, and adults at the earliest possible time of onset, and the correction of the causes of deafness, when possible.

Proper sanitary living conditions, as to fresh air with proper humidity in dwellings and sleeping quarters, proper clothing, so as to prevent repeated colds and upper respiratory infections, are the first essentials of prophylaxis. Dietetic regulations are of equal importance. Malnutrition, due to lack of fat vitamins, predisposes and underlies deafness. Deafness frequently dates back to an attack of scarlet fever and measles, when the attending physician is satisfied to get the patient over the contagion, while the overlooked ear sequelæ may lead to a handicap every bit as momentous as a heart or kidney complication.

Conditions which may cause deafness, such as head colds, sore throats, nose and sinus infections, and nasal obstructions, should be treated. Forceful blowing of nose, explosions and loud noises, such as those encountered in aeroplanes or in boiler works, diving in contaminated waters (swimming hole earaches) excessive quinine and salicylate medication and direct trauma should be avoided. In acute purulent middle ear involvements, a prompt and proper paracentesis of the drum may save the hearing. The usual conservation of hearing following an early mastoidectomy is most gratifying.

The field of otology has long seemed to offer little which was gratifying to patient and physician, outside of a few measures like mastoidectomy, paracentesis, and removing cerumen; while efforts to help the deaf usually proved futile and useless. Not so long ago the idea prevailed that little or nothing could be done to prevent a child with defective hearing from becoming a deaf adult. It must be remembered that in treating chronic deafness in adults we are tackling the problem from the wrong end.

We know now that we must detect and eliminate the underlying causes early in life. Regular periodic examinations in our schools where we can reach all of our future citizens will, if properly followed up, reduce the incidence of the serious economic handicap resulting from reduction in hearing to a fraction of its present alarming proportions.

HEALTH CONDITIONS IN THE UNITED STATES

In a report recently made to Congress, Surgeon General H. S. Cumming states that reports of the prevalence of communicable diseases received by the Public Health Service from State health officers and preliminary reports of deaths from several sources indicate that the health record for the United States for the calendar year 1930 was exceptionally good. The record for the first half of the year 1931 was also generally good, although an epidemic of mild influenza during the early months of 1931 increased the death rates for a time and gave the year an inauspicious beginning.

The geographic distribution of smallpox in the United States is very irregular. Seven states—Kansas, Delaware, District of Columbia, Maine, Maryland, New Hampshire and Rhode Island—reported no cases of smallpox in 1930. The greatest prevalence of smallpox in that year was in South Dakota, with 259 cases per 100,000 population. Indiana reported 164 cases of smallpox per 100,000 population, and the State of Washington 152 cases per 100,000 population.

During the calendar year 1930 the incidence of influenza in the United States was unusually low. The death rate from influenza for the year 1930 was 18.7 per 100,000 population as compared with 54.6 per 100,000 population in 1929 and 42.1 in 1928. The fact that there was no general outbreak of influenza during 1930 probably helped greatly in keeping the general death rate for the year low, as there is usually an increase in the number of deaths attributed to certain other diseases when influenza is prevalent.

Infantile paralysis was more prevalent during the calendar year 1930 than it was in 1928 or 1929. In the spring of 1930 the reports showed increased incidence of infantile paralysis on the Pacific Coast, and later considerable numbers of cases of the disease were reported in other parts of the country, especially in Louisiana, Oklahoma, and some of the North Central States. In the country as a whole, infantile paralysis reached its peak for the year about the first of October. An outbreak began in New York City soon after the close of the fiscal year. This outbreak later reached considerable proportions, the number of cases being considerably in excess of those reported for the preceding year.

The tuberculosis death rate for the calendar year 1930 was the lowest ever recorded by the Public Health Service. It was 68.5 deaths per 100,000 population as compared with 73.1 in 1929 and 76.4 in 1928. In 1900 the Bureau of the Census recorded a death rate from tuberculosis of 201.9 per 100,000 population. The difference between the tuberculosis death rates of 1900 and 1930 represents a saving of more than 160,000 lives in 1930 which would have been lost from tuberculosis in the United States if the 1900 rate had prevailed that year.

The prevalence of typhoid fever has been decreasing in the United States since comparable yearly statistics of cases and deaths have been available. During the calendar year 1930 a slight reaction was shown by the reports. The increase was reported during the last six months of 1930 and in some States at least it may have been influenced by the drought conditions which resulted in pollution of water supplies or necessitated the taking of drinking water from new or unknown sources. The typhoid fever rates as computed from reports to the Public Health Service were as follows: 1930, 22 cases per 100,000 population; 1929, 19 cases; and in 1928, 22.7 cases.

The case and death rates for diphtheria in 1930 were the lowest which the Public Health Service has ever recorded—54.2 cases and 4.9 deaths per 100,000 population. Ten years ago, 1930, the diphtheria case rate was 155 per 100,000 and the death rate was 15.3 per 100,000.

From 1924 to 1928, there was an increase in the prevalence of pellagra in the United States. In 1929 the reported incidence of the disease decreased somewhat, and there was a further decrease during the year 1930. During the first six months of 1931, however, 16,385 cases of pellagra were reported to the Public Health Service as compared with 13,359 cases reported during the first six months of the preceding year.

More than 1,450 cases of undulant fever were reported to the Public Health Service for the calendar year 1930. The disease has been recognized in every State of the Union.

Rocky Mountain spotted fever is not reportable in many of the States east of the Rocky Mountains. In 1930, 167 cases were reported from California, Colorado, Idaho, Montana, Nevada, Oregon, Washington and Wyoming. During the year workers of the Public Health Service identified, by laboratory and clinical studies, Rocky Mountain spotted fever, eastern type, in several States along the Atlantic seaboard. There is evidence to indicate its existence in this area, at least since 1909. In 1931 cases were reported in the District of Columbia and Maryland.—U. S. P. H. S., Dec. 28, 1931.

THE INJECTION TREATMENT OF HEMORRHOIDS: SOME FALLACIES AND COMPLICATIONS*

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FROM being the orphan among medical specialties, the past ten years has seen proctology emerge as the Cinderella of the golden slippers. Never before in the history of specialization has there been such a sudden rise to popularity. I believe this unusual interest to be due very largely to the aggressiveness of certain individuals who are giving short courses in proctology on a commercial basis. The average physician has had little instruction in proctology and is anxious to increase his knowledge of the subject. This being the case, he is a ready victim for some plausible individual, who, for a fee of $200 to $500, promises to give a complete course in the diagnosis and treatment of rectal diseases, all in the period of a week or two. The inference is made that the subject is so easy that this short course is all that is needed and treatment is so simple that no further observations are essential to learn all that is necessary to know.

When seriously considered, these inferences and claims, of course, are ridiculous. Complications may arise from any form of therapy and a fellowship in proctology at the Mayo Clinic or the University of Pennsylvania requires three years of study.

The subject usually most stressed in these courses is the injection treatment of hemorrhoids. This is probably because hemorrhoids are the most common of rectal affections and because the hypodermic injection of a solution into the pile seems a most simple matter. Because the procedure is so easy and seemingly harmless there is resulting a crop of unnecessary complications and incomplete cures. These patients are then coming to the surgeon asking surgical relief, being convinced that the injection method is a failure. This is to be regretted for the injection method is of great value provided the operator knows how to use it and knows its limitations and the complications which may arise. It is the purpose of this paper to point out a few practical facts concerning the injection method of treatment and to call attention to certain complications which one is almost certain to encounter if he has a large enough series of cases.

The theory of the injection treatment of hemorrhoids is the injection of a solution either directly into the substance of the pile, *i.e.*, an interstitial injection or the injection of a solution just underneath the mucosa above and covering the hemorrhoid. In either case the result is usually a thrombosis of a portion of the hemorrhoidal vessels and an inflammatory reaction which when replaced by scarification obliterates the varicosities. If it is kept in mind that this is the change which is brought about, many complications can be avoided.

Type of Pile to Inject.—The only type of pile suitable for injection is the internal hemorrhoid, which, when injected, will remain above the internal sphincter muscle. *No other type should ever be injected.*

Solution.—In the past escharotic solutions were commonly used for injection with the idea of producing a slough. At present milder solutions are used with the idea of producing an inflammatory reaction but avoiding slough. A slough is considered an undesirable complication. Enough irritation to produce fibrosis is all that is needed to produce a cure. Quinine urea hydrochloride (5 per cent) or phenol (20 per cent) in equal parts of glycerine and water are satisfactory. For submucous injection 5 per cent phenol in Wessons or olive oil is best. There are exponents of both methods of injection. We use both, the interstitial type of injection for the very vascular hemorrhoids and the submucous injection for those less vascular, and especially where the hemorrhoids are associated with some prolapse of the rectal mucosa.

The average amount is from 1 to 2 c.c. of quinine urea hydrochloride, 5 to 10 min. of the 20 per cent phenol solution and 2 to 5 c.c. of the 5 per cent phenolized oil solution. Of course, more may be used in some cases, but it is better to err on the side of too little. Too large an amount of solution is one of the most common causes of complications.

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*Read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

Injection.—If the patient is to be active two areas are sufficient for one injection. If the patient has a sedentary occupation or is not working, the complete ring may be injected at one sitting. It is safer to inject a smaller number.

Too frequent injection is also a very common cause of complications. Most texts and papers state that the hemorrhoids should be injected every three to seven days. This is a serious mistake. The period between injections should not be governed by time. The only criterion is the condition of the hemorrhoid. If there is induration still existing from the previous injection it should not be reinjected. Whether it be a day or a month one should wait until the induration has subsided.

The minimum time under favorable circumstances in which a cure may be promised is four weeks. We prefer to take eight weeks. If speed is necessary surgery is more certain, and I believe safer.

There is no way of telling in advance exactly how many treatments may be necessary to produce a cure in a given case of hemorrhoids. We can only be sure that a case is actually cured, when, upon examination, after all induration has subsided, no hemorrhoids are present.

Complications.—Usually these are not of serious character although fatalities may occur.

Most patients complain of some pain. Any pain, however, which is more than a dull ache and lasts more than a few hours should be classed as a complication. Severe pain usually results from injecting the solution too low down, that is, into an anal or external hemorrhoid. In some cases this pain may be severe and continuous for from three to ten days. Pain also may follow a slough, especially if the slough is near the ano-rectal junction. Pain is also present where an abscess forms, complicating the injection.

Slough is probably the most common complication. Personally, I would not believe anyone who does any considerable number of injections and says he never had a slough. Usually the slough is superficial and no ill-effects are noted. In fact, unless an examination is made, neither the patient nor the physician is aware that it has occurred. It is usually caused by the solution being injected too superficially or in too large an amount, or the injection being made into a hemorrhoid which is still indurated from a previous injection. While sloughs are usually of no permanent consequence they may be severe. Buie reports two cases where the tissues of both ischio rectal fossæ almost entirely sloughed away. Other complications which may follow a slough are hemorrhage, adenitis, fistula and septicemia.

Hemorrhage usually follows a slough. This is in most cases slight in quantity but an artery may be opened up which may produce alarming symptoms. A drop in hemoglobin to 40 or 50 per cent may occur. It is not always possible to tell when the bleeding begins as the blood backs up in the colon. The first intimation that a hemorrhage has occurred is a desire to evacuate the bowel. Then the patient may pass a pint or even a quart of blood. If one is unfortunate enough to have this complication occur, a speculum should be inserted, the bleeding vessel sought out and a stitch put around it. Anything less than this is a waste of time.

Occasionally an abscess instead of a slough may form. This may appear as a swelling near the margin of the anus and must be opened externally. In this case there is a complete fistula to deal with. At times nothing appears externally and a submucous abscess develops which breaks or is opened into the rectum. I have seen three cases where the slough or abscess as the case may have been, opened into the vagina producing a recto-vaginal fistula. I have been fortunate enough not to have this complication occur in any case I have injected myself, but where the recto-vaginal septum is thin from the lacerations of child bearing it is well to be very careful in injections on the anterior rectal wall.

With an abscess or slough adenitis may occur. I have seen the inguinal glands involved and I am sure that in some cases the deeper pelvic glands may also become involved. A temperature of 101 to 103 is not uncommon in these cases. In all cases I have seen, the inflammation has subsided without suppuration.

Liver abscess is a rare complication. Authentically, I know of but one case reported in the literature. In times passed this complication was brought forth as a "bogeyman" by all opponents of the injection method. It occurs but seldom but it cannot be ignored.

A few very severe systemic reactions have been reported following the use of quinine urea hydrochloride. This is due either to an individual or familial idiosyncrasy to quinine. Rapid thready pulse, prostration or syncope, with or without skin eruption, are the common symptoms. Severe reactions to phenol are more rare.

Strictures are of two types. The first follows extensive sloughs and is caused by cicatrization of the healing process. Needless to say, this is an avoidable complication. Rosser recently reported a stricture due to the use of a large amount of oil solution where globules of oil became encapulated in areas of scar tissue.

Failure to secure a cure should probably not be classed as a complication. Yet it occurs so frequently it should be emphasized. It is due to but three things: the improper selection of cases, an improper method of the injection, or discontinuing the treatment too soon. The last named is probably the most important.

In conclusion I want to say that this paper is not presented with the idea of discouraging any one from using the injection treatment of hemorrhoids. Rather it is a plea for a more thorough investigation and general understanding of the method that it may not be discredited by indiscriminate and improper usages. The operator should realize at the onset that the method is not as simple as it sounds and that a thorough understanding of all the processes occurring during the entire course of treatment is necessary if complications are to be avoided and good results secured. Lastly he should know the complications which occasionally arise even under the most careful treatment and know the best methods of dealing with them. With this knowledge the injection method will be found to be most satisfactory both to the patient and the physician.

THE INTRAVENOUS USE OF BARBITAL COMPOUNDS

The Council on Pharmacy and Chemistry reports that more than seven years have elapsed since the introduction of the intravenous use of barbitals, sufficient time to justify an assay of the possible value of the method. Since the chief object of the intravenous use has seemed to be the possible employment of barbitals used in this way to produce anesthesia, the Council reports on the possible changes following intravenous injection, a comparison of the experimental and clinical results, and attempts to determine if the intravenous use has peculiar advantages over other methods of administration, with equal safety. The Council points out that there is no doubt that the characteristic hypnotic action of the barbitals can be obtained by oral administration; that since the barbitals act essentially as hypnotics, and not as anesthetics, it is reasonable to entertain doubts about radical departures from the orthodox usage of these drugs, but the new methods of using and new uses for well known drugs merit attention; and that, moreover, the intravenous use of barbitals has been widely exploited by some manufacturers and serious attention has been given to the subject experimentally and clinically. From an exhaustive review of the literature it is concluded that any advantages that may exist in the choice of barbitals as aids in anesthesia, or as sedatives, analgesics or hypnotics, can be easily procured by giving them by mouth, with the further advantage of avoiding the necessity of the small operation and aseptic technic for intravenous injection and the unnecessary disturbances and complications of such injections in general, and that about the only argument in favor of the intravenous route would be an occasional rapid action in an emergency, and that hence their intravenous use should be limited for the present to conditions in which oral administration is not possible or when a very prompt action is imperative. (Jour. A. M. A., December 19, 1931, p. 1886.)

SEVENTEENTH CENTURY PEDIATRICS*

AN ANTHOLOGY

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A DISCUSSION of the men who contributed to pediatric progress in the 17th century must give some consideration to the work done by their predecessors, both remote and immediate, as well as to the habits of thought of their contemporaries in other branches of science. Events political, economic and religious, difficult to interpret without reference to world conditions have a distinct bearing on the type and quality of scientific productions. There have been periods in history when statesmanship made great strides, while medicine failed to register any noticeable progress. An example is found in the closing years of the preceding century. Queen Elizabeth of England established herself as one of the greatest ministers of statecraft, furthering peace and cementing a firm government, but she gave little consideration to public health or encouragement to medical research. Her father, Henry VIII, is credited with the initiation of vital statistics. The beginning was simple. He ordered that the incumbent of parishes keep a true and exact record of marriages, christenings and deaths. Possibly he feared his own marital adventures might so influence his subjects that some form of national bookkeeping would be useful. Elizabeth enlarged slightly upon this idea, but no real progress was made until the appearance of the Black Death. While she dallied with her lovers she allowed to slip away her day of grace so far as motherhood was concerned, and so ended the reign of the Tudors. Had she encouraged medical progress, particularly therapeutics, she might not have had to take for her dropsy that terrible concoction of strange ingredients prescribed by Gilbert. Elizabeth, shortly before her death, made amends to Mary Stuart by nominating James for the Crown. This monarch brought many of his favorites with him from Scotland but retained a few counselors from Elizabeth's reign, including Cecil, Bacon and Gilbert. The latter continued to hold the position of Royal Physician. Gilbert was more interested in physics than in medicine. It was in the first year of the 17th century that he brought out his epoch-making work on magnetism, the starting point of all subsequent work on terrestrial magnetic variations. Dryden's encomium, "Gilbert shall live until lodestones cease to draw," is still true. Such men exert a profound influence on the scientific thought of their contemporaries.

Among the many geniuses following Elizabeth's reign, none exerted a more profound influence on clear, concise thinking than Bacon. We should feel grateful for his influence upon Sydenham and Mayow. Kept in the background by his kinsman Cecil, he had little opportunity of demonstrating his power until the latter's death. His influence while he enjoyed royal favor and even after he was overthrown and living in forced retirement was a great stimulus and example to his contemporaries.

Civil disturbances in the latter part of James' reign and later under Charles I, culminating in the rise of Cromwell, did not interfere with scientific progress.

Moral and religious conditions, varying from the intolerance of Cromwell to the license of Charles, whose court was characterized as the "most scandalous in Christendom," encouraged a type of mental gymnastics which must have amused such men as Defoe, Dryden and others of the period.

It is conceivable that the disquieting time under James II was not improved after he ran away to Paris. William of Orange on his arrival from the Netherlands imposed many religious conditions which might easily have deflected the progress of scientific thought. While some possibly were intrigued or discouraged by politico-religious events, others found the times stimulating. This was not only true of physicians but of other outstanding characters. Certainly men like Butler, Bunyan and Milton found this period not altogether to their liking but the civic unrest did not retard their work. It was at this time that Wren rebuilt that portion of London which had been destroyed by fire shortly after the Black Death.

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In Central Europe, at the beginning of the 17th century, conditions were ripening for the Great War. Religious agitation, continuous for more than seventy years, finally culminated in the storming of the Council Hall at Prague. This incident started the Thirty Years War in much the same manner as a comparatively trivial event precipitated the World War. During the war and the years of reconstruction that followed, the German people found conditions little suited for the advancement of science, particularly medicine.

The politico-revolutionary movement begun in England spread in much the same fashion as the Reformation. In general, the effect was as varied as the races of the countries in which it struggled for recognition. The result was to stifle the progress of science except in the more phlegmatic countries like England, Holland and bilized.

Isolated exceptions were encountered in other countries even in the first years of the century. In France, where the institution of royalty had been consolidated to a point which made the monarchial structure seemingly imperishable, little consideration was given to child welfare. Cruelty to children was a national crime. This naturally led to a reaction which resulted in certain laws regarding the abandonment of children and the development of such movements for their welfare as that instituted by St. Vincent de Paul. The early years reveal the name of a French physician, Ballou or Ballonious. While he was active at that time his works were not published until after his death. He was much interested in the influence of climate and season on the prevalence of epidemic diseases. His article on whooping cough is quoted in Rurah's Pediatrics of the Past. This remarkable character wrote, as did Sydenham, in much the same vein as Hippocrates. He was called by Crookshank the first epidemiologist of modern times.

Conditions in America were not propitious for the development of medicine. Jamestown, the Plymouth colony and the New Netherlands naturally drew to them a number of European physicians, who, as in Russia, were active agents in advancing the interests of ligitimate medicine. Prominent among these were Bohun, Pot, Samuel Fuller, who came over on the Mayflower, John Winthrop, Jr., and Thomas Thatcher. The latter was the author of the only medical publication printed in the North American colonies in the 17th century. This contribution was the "Brief Rule to Guide the Common People of New England How to Order Themselves and Theirs in the Small Pox or Measles." Thatcher, in addition to his medical work, found time to become an excellent scholar in Hebrew and Arabic. He was also the first pastor of the old South Church in Boston.

The greatest name in 17th century medicine is that of William Harvey (1578-1657) of Folkstone in Kent. He was educated at the King's School, Canterbury, and was nominated to a scholarship preparing one for medicine at Cambridge.

Padua had been the greatest school of medicine for some time and Harvey went to that place which Vesalius and others had made famous. The University was governed largely by the students of the different nationalities. Harvey was chosen councilarius, an office which John Finch said entailed being "drunk at least forty times in the year." The teacher who had the greatest influence upon Harvey was Fabrica. This teacher, who performed his dissections in the amphitheater by candlelight, was greatly interested in the mysteries of the circulation. He demonstrated the valves in the veins and made many notable contributions to the subject of development. While Harvey made no direct contribution to pediatrics his work on "De Motu Cordis" produced a definite and far reaching effect. The crux of Harvey's argument as described by Garrison—"that the actual quantity and velocity of the blood, as computed by him, make it physically impossible for it to do otherwise than to return to the heart by the venous route"—was the first application of the idea of measurement in any biologic investigation. "Had he chosen to express his discovery in the language of algebra it would have taken its proper place in the application of mathematical physics to medicine. The importance of Harvey's work is not so much the discovery of the circulation of the blood as the qualitative or mechanical demonstration." With this start physiology became a dynamic science.

From the pediatric point of view the most interesting contributions of the 17th century were made by Walter Harris (1647-1732). His book on "Acute Diseases of Infancy" was referred to by Sydenham as one which "may be of more service to the public than all my own writings." In that treatise he broke away from the popular Hippocratic pathology of humors and affected the acid diathesis of Sylvius, viz: that "all the symptoms of gastro-intestinal disorders owe their origin to acid products in the body." He extended the concept of infancy beyond the classical three months of Galen to the fourth year, and extended the period of childhood to fourteen years.

The difficulties and discouragements of pediatric practice made a deep impression upon Harris. He believed "that the cure of a sick child was as much to be desired as anything in the whole Art of Physic, and of consequence not only to the nobles, wealthy and powerful, but to parents of any rank whatsover." He discoursed at length on the value of history and observations obtained from nurses, upon the hereditary influence in children's diseases, the importance of correct diet, and the advisability of limiting opiates and wine. Concerning the latter, however, he held different views regarding its use in later life. He insisted upon specific directions, noted the seasonal appearance of diarrhea and painted gruesome pictures of marasmus and convulsions. His book held its place for 100 years, or until Underwood's work supplanted it. While Harris was not as great a physician as some others of his time, he was a shrewd, honest practitioner of pediatrics, a keen observer who taught simplicity, caution and common sense.

A far greater name is that of Thomas Sydenham (1624-1689). He was not a pediatrist, but a general practitioner, a man without hospital connections or official office of any kind, not even a Fellow of the Royal College, yet he left his imprint upon medicine for all time. He revived the Hippocratic method of observation and experience. In fact, he stands as a representative of the clinical and bedside approach to the problems of disease, just as his contemporary, Harvey, stands as a prototype of the experimental investigator.

Sydenham had little patience with the laboratory or with research, largely, Reisman believes, because of the preposterous claims and fanciful theories resting upon meager data. The scientific theories of the time were of little value to him at the bedside. He relied upon his powers of observation and his fund of experience.

Sydenham had a late start in his medical career. He was born of Puritan parentage in Dorsetshire, a place called by Lord Clarendon "the most malignant spot in England." It is not strange that this Roundhead felt impelled to leave Oxford to take service in the Army. Later he returned to Oxford, but took his degree at Cambridge at the age of fifty-two.

There had been sporadic instances of accurate descriptions of disease before the time of Sydenham. Glisson had given his classical description of the English disease, and Mayow, the greatest genius of the century, had shown evidence of his powers of observation and deduction, but Sydenham was the first real clinician of modern times to observe and record the progress and treatment of disease. He drew sharp distinction between acute and chronic disease. He laid much stress on bodily disposition, age, sex, season and climate, and their influence on the course of disease. His description of gout and stone (he suffered from both), and of smallpox are unsurpassed. He is credited with being the first to describe and name scarlet fever. He did not, however, recognize the sore throat or the fact that it was contagious. He introduced the so-called cooling treatment, used the bark discovered by the Jesuits in the treatment of ague and invented the mixture not unlike our wine of opium, called Sydenham's laudanum. He believed that a patient making satisfactory progress should be let alone and not drugged. He pointed out that the secondary manifestations of epidemics varied from time to time and that one complication was more prominent at one time than another.

In Sydenham's last work on the appearance of a new fever, appears his masterly description of chorea. While not as accurate as his work on gout, it is the study by which he is best known.

What Sydenham's attitude toward experimentation might be today we can only surmise, but he surely was not reactionary in temperament and would have undoubtedly welcomed every aid to his understanding of disease.

I have just named John Mayow (1643-1679) as the greatest genius of his time. But he was a neglected genius. During his life he did not attain the position he should have held and even now he is comparatively unknown. His recognition of oxygen and of combustion led to his remarkable work on respiration. This work was influenced by Lower, the brilliant experimental physiologist, on whose skillful dissections much of the reputation of the more famous Willis rests. He showed that the maternal blood supplied the fetus with oxygen as well as food. His work in chemistry was brilliant. His death at the age of thirty-six is said to have delayed the advance of modern chemistry more than a century.

From a pediatric standpoint his description of rickets is of interest, especially that portion which deals with diagnosis. His observations, presented in terse, short sentences, are remarkable when compared to the verbose reiterating style of Glisson.

Francis Glisson (1597-1677) was one of the brighter lights of English medicine in the 17th century. His work on the anatomy of the liver will always be remembered as his name is associated with the capsule. He was the first to use the word and the idea of "irritability," which means so much to modern physiology. His work on rickets is the foundation of our knowledge of this disease. Some consideration may well be given to the limited knowledge of rickets existing in Glisson's time.

Whether rickets was to be considered a modern disease or whether it was equally prevalent centuries before was a subject for much discussion. Statements by Greek and Roman philosophers and physicians which seemed to refer to this disorder are not sufficiently precise to convince one that they did not refer to some other disease accompanied by deformity of the bones.

The most remarkable feature in relation to the history of rickets was the sudden appearance, or at least marked increase in incidence in the 17th century. To such an extent was this manifested in England that a commission was appointed with Glisson at its head to gather reports and communications relative to the disease.

Glisson's publication was preceded by five years by a little book written by Daniel Whistler after that worthy had been elected "in an evil hour" to the presidency of the College of Physicians. The fact that this man had heard of rickets rather than studied it is fairly evident from his book. At least one other mention of rickets had been made previously, namely, an article by one Arnold De Boot, a Dutchman serving in the English army.

Glisson had as his collaborators six men, all members of the College of Physicians. They collected papers and communications made at private meetings and attempted to edit the material. When Glisson had interwoven his part containing many views differing from those commonly held, they committed the whole work to him in order to avoid deformed and misshapen statements. His work comments on the antiquity of the disease, dwells on the fact that it is not luetic in nature, devotes chapters to anatomical observations before the body is opened and after, gives a long account of the changes in the bones, with resulting deformities, speculates on the causes, including diet and "such things as are taken inwardly," puzzles over the fact that it is not observed until the sixth month, refers to its association with other diseases, especially scurvy, and gives a good account of the signs and symptoms. His therapy was that of the period.

This lengthy report reminds Ruhrah of the remark that Milton's Paradise Lost is a fine work but no one has been known to wish it one line longer.

The work is a monument to Glisson's powers of observation and description and is so complete that, apart from the information afforded by technic not at his disposal, little has been added since.

The name of Robert Pemell (?-1653) is not among the great in English medicine, yet he made a valuable contribution to pediatric literature by his book on "Diseases of Children" and later by a popular treatise entitled "Help for the Poor." In this he established himself as being in the vanguard of welfare workers. It considers the diseases of children, particularly those common among the indigent. It shows him to have been a pioneer among those interested in the prevention of infant mortality. His therapy employed was the usual absurd remedies of his day, but included baths, the external use of wine and of sulphur for suppurating skin diseases. All of his remedies had the merit that, if they did not help, they did not harm.

His chapter on worms shows that many of the symptoms now attributed by the laity to this infection are not of recent origin but existed during his time. After citing a number of these vagaries he closes his chapter on diagnosis with the statement that "The most certain sign of all is when they void worms in the excrement." He was an author of merit, a technician of ability, a pediatric thinker in some ways ahead of his time and one of the early workers in the field of infant welfare.

If we were to consider Francis Sylvius (1614-1672) solely from his pediatric work we would do rank injustice to this great man. He wrote a little pediatric text in "Familiar style for weaker capacities" which was published in Amsterdam and later in London. In it is combined a treatise on rickets. It contains much common sense, but some absurdities, most of which are a reflection on the time rather than the man. He is best known as an anatomist, his name being connected with at least five portions of the brain. He also was a brilliant teacher, physiologist and clinician. Students from all over Europe flocked to his clinic at Leyden, among them Willis, who concentrated on the study of the brain, aided by the neglected Lower, De Graff of the graffian follicles, Stensen, Swammerdam, who described the red corpuscles, and Van Horn of thoracic duct fame. No student of the time who had not attended his dissections felt that he knew anatomy. His method of clinical instruction has been much quoted and is followed by many of the great teachers of today. Naturally, with the limitations of his time, many of his concepts were incorrect, but he gave a great impetus to medical observation and thought.

To credit all the men who contributed indirectly to the progress of pediatrics in the 17th century would require some discussion of most of the physicians whose names still live, and many outstanding characters in other sciences. The progress made was not limited to the cure of the child but included social and cultural aspects as well. Painters who previously had used children only for religious pictures were awakened to their artistic possibilities. Musicians and sculptors for the first time recognized the child as an asset. Previous to the time of Hugo, the child occupied an infinitesimal place in literature.

From a pediatric standpoint the effect of the 17th century workers can be classified under three heads:

1. The recognition that the life of a child might be worth saving. This was a new concept. Development of the movement we know as infant welfare really began in this century.

2. The influence of Harvey which resulted in an age of specialized anatomic research which was notable for its long array of individual discoveries and investigations, nearly every one of which had a physiological significance. This was responsible for the immediate advancement of medicine, yet it contained much faulty philosophy. Its votaries were primarily philosophers and secondarily physicians.

3. The effect of the school of Sydenham, which actually observed and recorded the progress of disease. It was responsible for the development of clinical medicine.

To us, the influence of colonial medicine on the type of practice existing in America for a long period following this era is interesting. This was due, Garrison believed, to two factors: (1) the youth who studied with a physician under indentures of apprenticeship received actual bedside instructions from the start; and (2) under primitive frontier conditions the medieval antagonism between the physician and surgeon soon disappeared for the necessary and sufficient reason that the frontier doctor was called upon to meet any emergency, surgical, obstetrical and medical. As Handerson says, "Many of these apprentices doubtless proved as successful physicians as some of their more fortunate colleagues who boasted an M.D. of Leyden, Aberdeen or Cambridge and "Slew their patients" "Secundum Artem." We may agree with the same authority that, from this period on, American medicine acquired the eminently practical tendency which has been its chief merit.

CASE REPORTS

FRACTURE OF THE TEMPORAL BONE

REPORTS OF TWO CASES WITH UNUSUAL SEQUELÆ

John F. Curtin, M.D., and
Lawrence R. Boies, M.D.
Minneapolis

Involvement of some portion of the temporal bone in skull fracture is common. The more serious injuries in which the temporal bone chiefly is concerned, usually involve the petrous portion.

The main types of temporal bone fracture can be briefly classified as follows:

I. Longitudinal

(a) Usually run along the anterior border of the pyramid beginning in the anterior fossa or in the region of the Gasserian ganglion, and ending in the tegmen antri or tympani and external auditory canal. The facial nerve may be involved.

(b) Posterior to the pyramid and involving chiefly the mastoid process and bony covering of the lateral sinus.

II. Transverse

Comparatively rare. Cross the pyramid at right angles and usually at the weakest portion, the region of the vestibule. Unless the lateral wall of the inner ear is involved, which is rare, hemorrhage from the ear does not result.

III. Avulsion of the tip.

Very rare. This type should not affect the inner ear but may cause injury to the nerves at the internal auditory meatus.

Labyrinthine fractures show a tendency to close by fibrous instead of bony union, and therefore a late meningeal infection from the middle ear is an ever present possibility.

Objective examination of the auditory and vestibular function reveals the seriousness of the injury as far as damage to the temporal bone alone is a factor.

The following cases of skull fracture involving the temporal bone are of particular interest because of their unusual sequelæ:

Case 1.—A six and one-half year old girl was hospitalized in a semi-conscious condition on September 3, 1930, an hour or two after being struck and knocked to the pavement by an auto. Examination revealed a fractured ankle and multiple body bruises in addition to a bleeding left ear with ruptured membrana tympani. She seemed totally deaf in the injured ear; the escape of cerebrospinal fluid was not noted. A basal skull fracture was suspected although the plates taken of the skull (stereoscopic lateral) were negative. She was seen on the day after her injury by Dr. Curtin at the request of Dr. T. W. Weum.

Her general condition improved during the following week, but she complained of pain in her left ear. No significant neurological symptoms were evident; she had been conscious since a few hours after her admission to the hospital. The fractured ankle had been reduced and immobilized; her bruises healed. A serosanguinous discharge from the ear on the day following injury had developed a mucopurulent character with an increase in amount. Moderate pressure over the cortex of the mastoid elicited considerable tenderness.

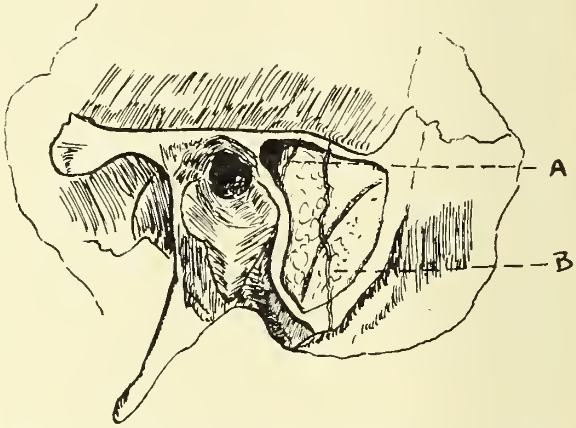


Fig. 1. Diagrammatic representation of site of fracture lines, *A*, Case 1; *B*, Case 2.

On September 12, a partial left facial paralysis was noticeable. No other significant signs were evident except a slight increase in the amount of discharge. The X-ray examination indicated a pneumatized left mastoid, clouded, and without definite evidence of cell destruction. There was a rise in temperature on the next day to 101 degrees (mouth); the facial weakness was more marked and she complained of pain over the left side of her head. There was also some sagging of the postero-superior canal wall. The leukocyte count was 19,000. Her febrile manifestation is indicated on Chart I (only the morning and evening temperatures are recorded, as they show the general trend, though four hour temperatures were kept).

On September 14, left simple mastoidectomy was performed (Dr. Curtin). Considerable destruction was evident especially about the antrum in the region of the zygoma and toward the solid angle. A line of apparent fracture was observed extending through the tegmen of the antrum. All cells were exenterated.

Convalescence was uneventful. The facial weakness completely cleared and she was discharged home on the twelfth day after operation. At the time of discharge, however, the middle ear, which at first had been dry following operation, was again discharging a little, and she complained at times of a dull left sided headache.

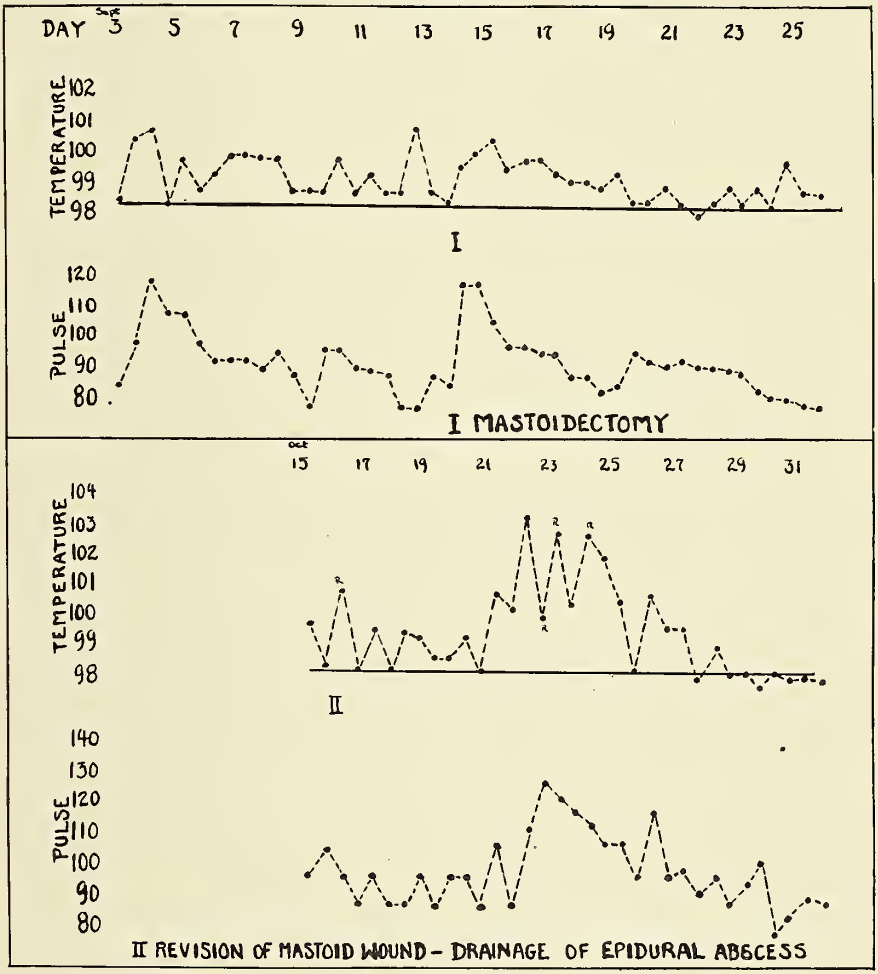
There followed an eighteen day period at home. During the first week slow improvement was noted. In the second week, she was feverish at times and there was an increase in the frequency and severity of headache over the left temporal area. She was readmitted to the hospital on October 15, at which time her temperature was 101 degrees, there was an increase in discharge from the middle ear, and drainage from the post-aural wound, and she complained bitterly of headache. The white blood cell count was 13,000. Dr. H. B. Hannah saw her in consultation; the neurological examination was negative for evidence of intracranial disease or meningitis.

A secondary mastoidectomy was performed on October 16. There was evidence of delayed healing in the wound. No cellular structure was noted. The line of fracture traversing the tegmen of the antrum was again observed. At this site, an area of dura over the middle fossa was uncovered revealing a large epidural abscess, which was drained. The lateral sinus plate was also removed from knee to tip; the sinus appeared to be normal.

The post-operative course was marked by some immediate improvement. Her headache was relieved but did not entirely disappear. Toward the end of the first post-operative week it became more severe. The temperature curve is shown on Chart I. On October 21, there was a sudden rise in temperature to 101 degrees (mouth). On the next day she complained continuously of severe headache; a stiff neck and a positive Kernig reflex had developed. A lumbar puncture revealed a cloudy spinal fluid under 28 mm. of mercury pressure and a cell count of 2,275, ninety-five per cent of which were polymorphonuclears. No organisms were found on smear or culture. For two days her condition remained about the same, the temperature being elevated and headache severe. She vomited several times. Another spinal puncture, on October 24, showed marked improvement of the spinal fluid with a cell count of 611.

Gradual improvement followed; she left the hospital on November 1. Subsequent examination showed an

CHART I



intact left ear drum completely healed, a healed post-aural wound, total deafness in the ear and no evidence of vestibular abnormality. On August 1, 1931, she was in excellent general health.

This case illustrates the longitudinal type of fracture involving the petrous portion of the temporal bone, with fracture line through the tegmen of the antrum. The absence of vestibular phenomena would suggest that the fracture involved the cochlea, inasmuch as complete deafness resulted in the affected ear. If deafness was due to injury of the eighth nerve in the internal auditory canal, one would expect evidence of vestibular disturbance. The absence of escaping cerebrospinal fluid from the ear points toward no injury at the internal auditory meatus, as it is here that the meninges are prolonged into the meatus, and a tear in them with rupture into the subarachnoid space accounts for the escape of cerebrospinal from the ear in these cases.

The development of an otitis after this injury is accounted for by infection of the middle ear through the eustachian tube. The probable effusion into the mastoid of blood and serum following injury formed an excellent medium for suppuration to start.

The later development of the facial paralysis in presence of evidence of a suppurative otitis media rather indicates that this was due directly to the infection and not to anything cerebral. It is certain that there was no involvement of the facial nerve directly from the injury or there would have been some indication of it at that time. The onset eight days after the injury, with the most significant symptoms at that time related to an otitis media, is conclusive evidence that the paralysis was directly the result of the suppurative process. This is supported also by the subsequent course of events.

The manner of development of the pathological process that followed the mastoidectomy must in part be a matter of speculation. The location of this epidural abscess indicates the probability that the break in bone at the site of this abscess was a definite factor in its occurrence, although epidural abscesses are not uncommon complications of middle ear infections without temporal bone fracture.

Dr. Hannah believes that the symptoms following drainage of the epidural abscess, and the spinal fluid findings, indicate that a small intracerebral abscess developed which ruptured and drained into the subarachnoid space. This seems the most logical conclusion.

Case 2.—A six years old boy was admitted to the Pediatric Service of Dr. E. J. Huenekens at the Minneapolis General Hospital on April 28, 1931, an hour after he had been struck by an auto. He was still unconscious. Except for a few superficial bruises, some dried blood in his nose, a little fresh blood in his nasopharynx, and the presence of bilateral Babinski reflexes, his examination on admission was negative. He vomited several times during the next twenty-four hours.

He was still unconscious on the following day. There was evidence of a partial left facial paralysis. A lumbar puncture showed a spinal fluid pressure of 250-340 mm. of water, and blood due to the puncture.

During the following week, he continued to be unaware of his surroundings, but could be partially aroused and was irritable when touched. Consultation by the neurological and surgical services failed to elicit additional signs of any significance.

Gradually he became brighter. The facial weakness cleared. On May 21, he had developed measles and was transferred to the contagious ward. On June 2, a myringotomy was done on the left ear drum. No secretion was obtained.

His temperature rose to 105 degrees on June 6 (Chart II). The ear had begun to discharge pus. The patient rapidly developed a toxic appearance and seemed to be losing strength. An X-ray examination indicated destruction of the left mastoid. It was also noted that there was a line of lessened density just posterior to the tip of the mastoid and running superiorly and inferiorly, which suggested a possible fracture in this region.

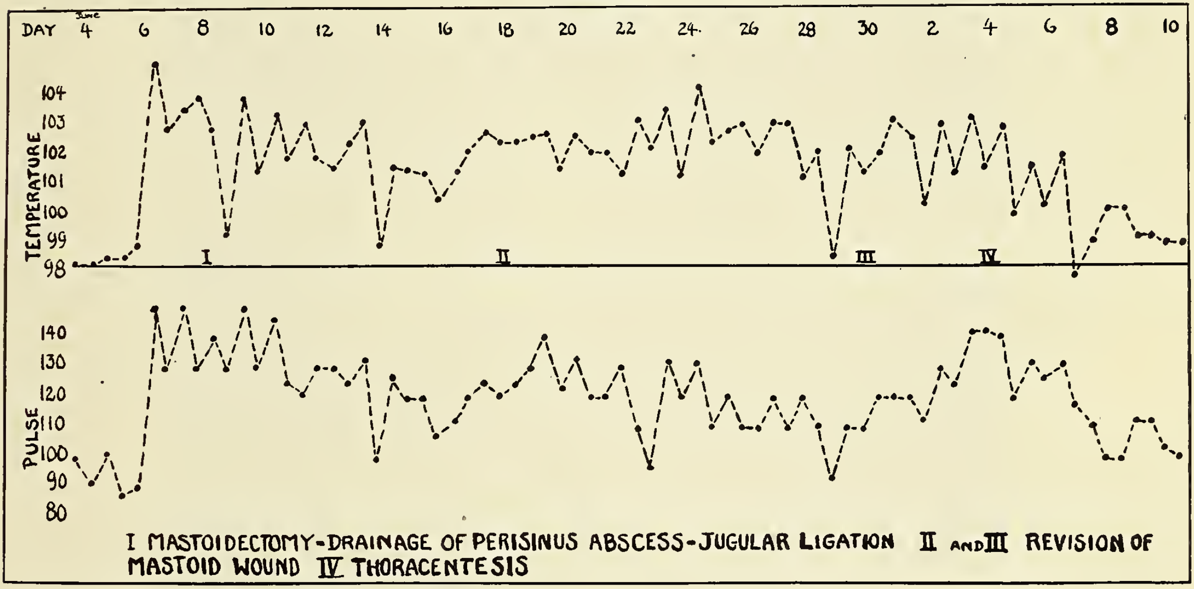
A simple mastoidectomy was performed on June 8 by Dr. Boies. On retracing the periosteum over the cortex, a fracture line was noted, the course corresponding to B, Figure 1. The cortex was removed with gouge and curette, revealing a mastoid in coalescent stage. All cells were exenterated. When the bony plate over the lateral sinus was exposed, a fracture line could be seen crossing diagonally throughout. The sinus was uncovered As the plate toward the tip was removed, pus welled up from a large perisinus abscess. At this point a portion of the lateral sinus wall, apparently necrotic, gave way when sponged and profuse bleeding followed which was controlled by an iodoform plug inserted in the space between the bony wall and the compressed sinus. Because of the presence of a phlebitis, and a probable thrombosis, as well as for the control of hemorrhage, a left internal jugular ligation was performed at this time. The mastoidectomy was then completed and the sinus packed off above the iodoform plugs.

The post-operative course was not particularly encouraging during the following week. On the third post-operative day, the sinus packs were removed but had to be replaced as complete thrombosis from the torcular end had not taken place. In three more days they were removed without further bleeding. A transfusion was also given. The temperature continued to be elevated and the patient's general condition did not improve.

On June 18, the mastoid wound was explored in search of the cause of his apparent general sepsis. Repeated general physical examinations were negative. There was little evidence of healing. A portion of the tegmen of the mastoid was removed at the site of the fracture line. The dura was injected; a small amount of granulation tissue covered it over the area exposed. This bled easily. No pus was seen. Further exposure of the lateral sinus was made by uncovering toward the torcular end. The central portion of the sinus had become obliterated and the portion toward the torcular end appeared healthy. There was nothing significant toward the bulbar end.

The post-operative course again was not encouraging. He continued to be rather drowsy, irritable when touched and the temperature remained elevated (Chart II). A bilateral positive Kernig reflex and some neck rigidity were elicited. Lumbar puncture revealed a normal spinal fluid pressure, a cell count of 22, eighty-five per cent of which were polymorphonuclears, and no organisms. Dr. J. C. Michael of the Neurological Service thought that he had an early meningitis. A myringotomy was performed on the right ear because of a thickened membrane tympani; no secretion was obtained.

CHART II



On June 30, the mastoid wound was again explored. The patient had continued to be critically ill and repeated general physical examinations by Dr. Huenekens and others had revealed nothing to account for his continued symptoms except the aural disease. At this operation (Dr. Curtin and Dr. Boies) a larger area of dura in the middle fossa was exposed by removal of the tegmen of the antrum and of the mastoid. The bone seemed to be very soft and devitalized. The whole mastoid cavity indicated that there had been little evidence of healing. Additional soft bone was removed in front of and behind the lateral sinus. The thrombosed sinus was incised and a portion of the clot removed from both ends; it appeared to be healthy.

On the day following this operation, chest symptoms developed, with elevation of pulse and respirations. His temperature continued elevated as shown in Chart II. Signs of fluid developed and on July 4, 100 c.c. of clear yellow fluid was withdrawn from the right pleural cavity.

A period of gradual improvement followed. He was given three transfusions during the following month and was able to leave the hospital on August 5. An abscess at the site of an hypodermic puncture in his left deltoid muscle had delayed his discharge from the hospital.

There was no evidence in this particular case, from an otologic standpoint, that the petrous portion of the temporal bone had been involved. The injury through the mastoid process probably resulted in the presence of serum and blood within the mastoid as a direct result of the injury. However, the development of an otitis in this case may not have been influenced by the local injury, inasmuch as the injury was followed by an attack of measles.

The fracture through the lateral sinus plate was undoubtedly a factor in the development of this perisinus abscess. There was evidence also that the infection reached the meninges above the fracture line through the tegmen of the mastoid. This probably was a prominent factor in the symptoms subsequent to the initial operation.

The appearance of chest signs occurred after the final operation on the mastoid. Repeated general physical investigation over a three week period between the initial and final mastoid operation had failed to reveal anything to account for the symptoms of that period. It is reasonable to assume, therefore, that they were the result of infection within the mastoid and its environs. Experience with similar cases in which areas of devitalized bone had to be removed before healing resulted, leads us to the belief that the final removal of all involved bone with wide exposure of the adjacent meninges was a definite factor in the recovery.

COMMENT

In cases of head injury with suspected fracture of the temporal bone, objective examination of the auditory and vestibular function indicates the seriousness of the injury as far as the temporal bone is concerned.

The development of a middle ear infection following fracture involving the petrous portion of the temporal bone, with extension of the fracture into the middle ear, or tegmen of the antrum, or following fracture of the mastoid portion alone involving the pneumatized portion or sinus plate, demands especially careful observation for signs of more serious complication which might arise due to the break in the bone. It is generally agreed that early intervention is indicated under these circumstances when signs of mastoid infection develop.

Persistent attention to the mastoid wound is necessary when symptoms of sepsis or delayed healing are evident and contributing causes elsewhere have been ruled out.

TUBERCULOUS PERICARDITIS

REPORT OF A CASE WITH RECOVERY

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Tuberculous pericarditis, while more common than is generally thought, probably occurs less often accompanying a childhood infection than an adult infection. Autopsy statistics show that in 25 per cent of all cases coming to post-mortem examination there is some tuberculous lesion present; in 1 per cent, tuberculosis of the pericardium has been found. Norris reports 82 cases of pericardial involvement in 1,780 autopsies on known tuberculous patients. Others report similar figures, averaging from 4 to 7 per cent. German figures show pericardial involvement in tuberculous children to be about 3 per cent.

Although tuberculous pericarditis is occasionally a primary lesion, it is usually a secondary infection and a coexistent pulmonary, bone, visceral or mediastinal lymph node involvement can be found. It must be remembered that there is a free communication between the pericardial cavity and the peritoneal and pleural cavities by way of the lymph channels.

The symptoms of tuberculous pericarditis are obscure and the diagnosis depends upon the finding of the primary lesion or definite evidence of a tuberculous infection. The patient has fever, a few chills. usually dyspnea and pain, which can be traced to the sensory fibers of the phrenic nerve. The pain may be sharp and stabbing, heavy or cramping; it may be directly over the heart, the manubrium or on the left side of the neck or shoulder.

The physical findings show widening of the area of cardiac dullness, and an X-ray will show widening and obliteration of the normal heart shadow. Change of position from the sitting to the recumbent posture will evidence a shifting of the area of dullness. A decrease in pulsation can be seen under the fluoroscope. Signs of lung compression at the angle of the left scapula, such as bronchial breathing and dullness, are usually present. A friction rub may or may not be heard. Removal of fluid for smear and animal inoculation will aid in the diagnosis. A fluid which is hemorrhagic or purulent should make one suspect tuberculosis. The quantity usually varies from 150 to 1,000 c.c. and is light amber to greenish-yellow in color.

The course of the disease is from several weeks to months, with development of circulatory symptoms, emaciation, continued fever, anorexia and signs of the concomitant tuberculosis. The prognosis is reasonably good.

Treatment in the main consists of strict bed rest and careful dietetic supervision. The results of aspiration alone are not encouraging and if the fluid is moderate and causing no discomfort thoracentesis is not indicated. When the heart shows signs of being crowded, pneumopericardium can be used and good results have been reported by several workers, such as Meyer, Castex, Wenckeboch and Oppenheimer. The use of air and lipiodol is recomemnded by W. Ackermann with report of good results. Lemaire also reports the use of lipiodol injection favorably. Pericardotomy has been practiced and brings about a drainage into the spaces surrounding the pericardium. Without surgery, resorption takes place gradually and can be promoted by the use of diuretics.

CASE REPORT

J. S., a male negro boy, aged 8, was admitted to St. Mary's Hospital, Duluth, October 26, 1929, with sore throat, cough, pain in the chest, loss of appetite and fever 100.8. These symptoms had been present for 10 days.

Past History: Negative.

Family History: Mother living and well. Father died of pulmonary tuberculosis; one sister at a sanatorium, with childhood tuberculosis; one brother, aged 4, died of tuberculous meningitis. Paternal aunt died of pulmonary tuberculosis.

Physical Examination: Negative except for chest, which shows impaired resonance over the left lower chest and axilla and showers of râles at both bases. Heart tremendously enlarged to percussion and a friction-rub present.

Laboratory Study: X-ray taken showed heart tremendously enlarged with definite pericardial effusion. No definite evidence of tuberculosis present.

Urine normal.

Sputum negative on seven occasions for tubercle bacilli.

Blood: R.B.C. 3,500,000; W.B.C. 5,800; Hgb. 70 per cent; calcium 17 and 15 mgm.

Electro-cardiogram: Inverted T wave.

Spinal fluid: Colloidal gold—111,222,000.

Course in Hospital: The patient's temperature remained around 101 and pulse 90 to 120 during his stay in the hospital. An attempt to aspirate the pericardium was made December 5, 1929, but no fluid was obtained.

On January 30, 1930, the von Pirquet test was positive and followed by a temperature of 103.

The patient had occasional short tetanic convulsions at seven to ten day intervals which would last about five minutes. A pericardial friction rub persisted during his stay. He was kept strictly in bed and given symptomatic treatment.

On June 24, 1931, the patient was transferred to Nopeming Sanatorium, where he was kept on bed-rest for eight months and then exercise was gradually stepped up so that now the child is attending school and goes to his meals. Sputum has always been negative for tubercle bacilli. The heart shadow has been closely followed by X-ray and a gradual return of the heart to normal size has taken place, exposing at its left upper edge a parenchymal lesion, undoubtedly tuberculous in nature.

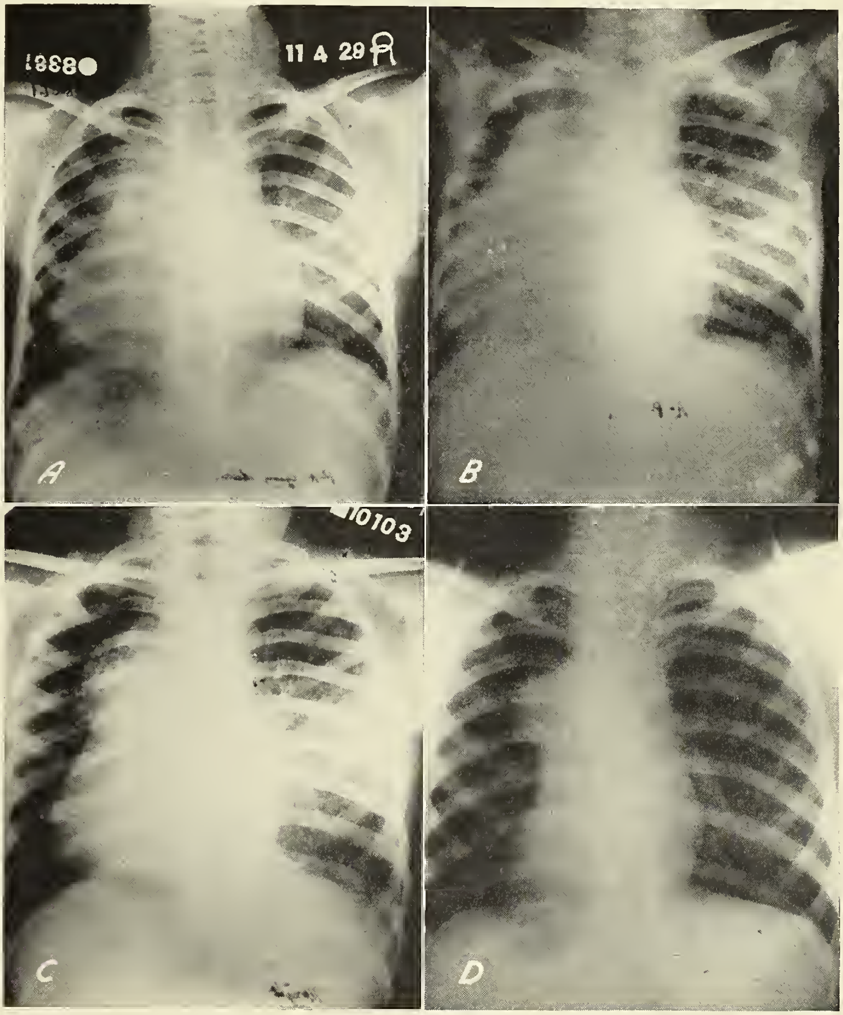

Fig. 1. X-rays showing progress in size of heart. View A was taken November 4, 1929; B, January 1, 1930; C, June 11, 1930; and D, June 6, 1931. View D shows tuberculous infiltration at the left upper edge of the hilus.

The patient had two or three convulsive seizures after admission to the Sanatorium, the last occurring in October, 1930.

Temperature and pulse have returned practically to normal. Treatment has been symptomatic, plus rest, diet and sun therapy.

In view of the suggestive history and findings in this case plus the adjacent tuberculous lesion in the lung parenchyma and absence of other etiologic factors, we feel sure that this is a case of tuberculous pericarditis even though no fluid was obtained to clinch the diagnosis.

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PRESIDENT'S LETTER

WE READ in various articles that the cost of medical care is beyond the means of the average man, meaning of the "white collar group" or of "the great middle class," and that something must be done about it. In many articles the inference is quite plain that the doctor is the chief cause of this. Just or unjust at this accusation may be, the medical profession must face it, and, if it is true, do the best possible to correct it or, if it is untrue, do the best possible to disprove it. A recent article in the American Medical Association Bulletin (December, 1931) by Dr A. H. Freiberg, past president of the Ohio State Medical Society, is well worth reading. Doctor Freiberg marvels, as many of us have, at the social philosophy that apparently insists that the chief relief needed by members of the great middle class is reduction of the cost of medical service for them and their families. No mention is made of, or remedies offered for, the really fundamental abuses affecting this group. What might be called socialization of medical service for the poor in one form or another, particularly in densely populated areas, is already accomplished. Socialization of medicine beyond that point is contrary to the fundamentally sound economic structure on which our country has developed and is not in accord with American ideals. Dr. E. S. Judd, president of the American Medical Association, in an article in the same issue of the American Medical Association Bulletin as that in which Doctor Freiberg's article appeared, pointed out that there are sound reasons for believing that the so-called high cost of medical care is over-rated, and that, owing to its elasticity, the cost of ill-health is in reality pretty well within control of the combined efforts of the patient and his physician in most instances. In the recent period of general inflation, hospital costs and the wants of the individual patient soared along with everything else.

It is only natural that a difference of opinion as to how medicosocial problems are to be met should develop between those who make their living in the actual practice of medicine and those engaged in preventive medicine, such as full time health officers. There never has been any difference of opinion as to the desirability of education in public health, of the institution of means to prevent disease, and so forth. The medical profession is and always has been solidly behind such measures.

However, this difference of opinion has been misinterpreted by many laymen to mean that the attitude of the mass of our profession toward these problems is one of indifference, and that the credit for delivering to the public the benefits of medical advance must be given to the social worker. We know this is not true; nevertheless, many have such an impression, and some of those who have it are truly friendly to the medical profession. The only answer is for organized medicine, through its representatives, to take the lead in all matters pertaining to public health.

Freiberg also aptly pointed out that, owing to the large number of measures which are directly or indirectly of importance to our profession and which are proposed for enactment in our legislative bodies, it has become necessary for organized medicine to be represented at every legislative assembly in the United States. This activity, not agreeable so far as it smacks of lobbying, may be rendered less obnoxious to us if we regard it as our fulfilling of a trust reposed in us, because the special knowledge we possess marks us as best fitted to know what is to the best interest of the public in matters pertaining to health. There is no evidence that this trust has been abused.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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CHOICE OF ANESTHETIC

The ideal anesthetic should entirely obviate pain, should be attended by no mortality or deleterious effects on any organ of the body and should be unaccompanied by complications. Have we such an anesthetic? No.

The discovery of the anesthetic properties of both ether and chloroform about the middle of the nineteenth century was a great boon to humanity. Chloroform, being pleasanter to take and requiring a less amount, soon became the more popular of the two. In recent years it came to be recognized generally that chloroform is definitely more dangerous than ether, not only because of the immediate mortality but because of late toxic effects.

Because of the definite disadvantages accompanying the use of ether—its explosibility, postoperative vomiting and occasional pulmonary complications—repeated efforts have been made to develop substitutes. Nitrous oxide has proven a good substitute for short operations but is decidedly more dangerous for prolonged anesthesia. Ethylene gas, a recent development, though possessing a less pleasant odor, is easier to inhale and is much less likely to be followed by vomiting. If it were not for the fact that it produces less relaxation and is also highly explosive, ethylene would come close to being the perfect inhalation anesthetic. Rightly it has largely supplanted ether.

Local anesthesia fills the bill for many surgical needs. Novocain, the drug most commonly used, is suitable for a great number of operations, especially where inhalation anesthesia is undesirable. Undoubtedly enthusiasm has led to an overextension of its field of usefulness. This has been particularly in evidence in the German clinics. Enthusiasts with well developed technic which includes nerve blocking have known no limit in their successful use of local anesthesia, but there is no question that for the general surgeon its use should be restricted.

The various more recent substitutes, scopolamine and morphine hypodermically, avertin rectally, and amytal intravenously, have in common the objection that an overdose leaves the surgeon helpless. The mortality rates with these drugs are higher and for this reason they should not and have not come into general use.

The rapid adoption of spinal anesthesia is a contradiction of the oft heard accusation that the medical profession is averse to the adoption of new methods. There are those who feel that spinal anesthesia has had too general adoption. The advantage of the resultant relaxation, greater than with any other anesthetic, is more than counterbalanced by the high mortality, the lack of control of the anesthetic action, the frequency of post-anesthesia headache and lowering of blood pressure which at times is alarming. The attending mortality is distinctly high and for this reason alone spinal anesthesia should be used in a restricted field by those who are well acquainted with the technic of administration.

In selecting an anesthetic, the patient deserves the entire consideration. His safety and comfort are of prime importance. Psychic trauma is real. Overenthusiasm for an anesthetic in preference to all others is a mistake. Selection should be made to suit the indications in the individual case.

SEVERE ANEMIAS—RECENT LITERATURE

Few medical subjects provide greater present interest than the field of hematology. Those who have followed the ideas and attitudes of laboratorians and clinicians for the past twenty-five years realize that the morphologists and symptomatologists have had their research and clinical innings in repeated sequences, where the game has been lively and the scoring heavy. Unit or dual origins of blood elements continue to hold less attention than the Hippocratic background of constitution, in which the bone marrow has offered the fundamental position.

The clinician who fails to sense this is likely to be lost while guiding himself by such supposedly "fixed harbor lights" as minus indices or attention to uncorrelated blood counts. For those who do not see a fair number of anemic patients the confusion in the literature is accentuated, because it is apparent that the atypical cases soon come to assume such frequency that they ultimately establish the basic principles involved rather than the "regular run of the mill."

The temptation is great (as has been shown by Watkins) to assume a pseudo- or pre-pernicious anemia category: individuals with low counts, achlorhydrias and hypochromasia. Dameshek[1] has recently discussed this type, but finds little difference in the "hyperplastic (sternal) bone marrow" except as to the microcytic or megalocytic cellular elements.

With this slight differentiation he might well infer that these severe hypochromasic anemias could well be a type or earlier stage of true Addisonian anemia. In any case, they seem to need iron, either because of faulty digestion and assimilation, with inadequate hemoglobin synthesis, or from other unknown factors; in any case, the present day heroic iron dosages are firmly established. This would obviously run counter to the older attitude concerning the futility of iron exhibition in pernicious anemia, because the tissues are often suffused with iron, the apparent result of extreme blood destruction. All the studies in tissue therapy (liver, stomach wall, kidney, etc.) concentrate upon the general idea that in active pernicious anemia the immature blood cells extruded into the circulation are either physiologically insufficient or defenseless against physiological removal; hence, it might be that a severe anemia in the hypochromasic stage might call for iron; if it should extend into the state of perverted and muddled bone marrow capacity, the resultant blood destruction might bring other needs to the foreground, exclusive of iron.

In this order Cassel,[2] with his ingenious feeding experiments, gradually draws our attention to the vital products eliminated or synthesized in the gastric wall. It would appear that his studies will greatly help to allocate to the clinical findings of degree and type of gastric secretion the true and accurate position of this vital phenomenon in the anemias as a whole. Whatever his "intrinsic factor" proves to be, it now seems to be entirely independent of the other measurable substances known to exist in normal gastric juice. While this is a qualitative factor, the "extrinsic" feature is quantitative, and has to do with the amount of meat or other protein upon which the intrinsic substance has had its action.

It is to be hoped that the unnecessary technicalities may be gradually disposed of and we may come to have a wholesome appreciation of the manner in which the gastrointestinal tract on the one hand balances off with pabulum and stimuli the effectiveness of the bone marrow system; likewise, the manner in which secretion as a whole is determined or inhibited by the central nervous system. In any case, the circulating blood may or may not furnish the criteria which indicate correctly how these other vital functions are carrying on. There would appear to be sufficient indication to justify an intensive drive to better understand bone marrow. Does any one think he knows much about it? It is time to proceed from a simple static attitude to an attempt to fathom its dynamic possibilities.

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[1] Dameshek, W.: Primary hypochromic anemia (erythro-normoblastic anemia). A new type of idiopathic anemia. Am. Jour. Med. Sci., 182:520.

[2] Castle, W. B.; Heath, Clark W., and Strauss, Maurice B.: Observations on the etiologic relationship of achylia gastrica to pernicious anemia. IV. A biologic assay of the gastric secretion of patients with pernicious anemia having free hydrochloric acid and that of patients without anemia or with hypochromic anemia having no free hydrochloric acid, and of the role of intestinal impermeability to hematopoietic substances in pernicious anemia. Am. Jour. Med. Sci., 182:741 (Dec.), 1931.

E. L. T.

MEDICAL HISTORY

The recent visit to the Twin Cities of Professor Henry E. Sigerist, Director of the Institute of Medical History, Leipzig University, has emphasized to the professional as well as to the lay mind the vital necessity of a philosophical background for anyone who is to attain proper eminence in the field of medicine. Dr. Sigerist spoke before the American Historical Association and was a guest at the winter meeting of COS-CNIDUS, a society which has for its object the congenial pursuit of the cultural and historic aspects of medicine. The reasons prompting the desire of the few to study the history of medicine should also stimulate the many to thought along these lines.

We are today, in this century, perhaps very near the crest of a golden age of scientific and mechanical achievement. There has been so much of factual and material addition to our lives, and in so short a space of time, that one stands a little dizzily upon the heights achieved with our hands, heights not, as yet, entirely realized by our imaginations. The advance has been so rapid, especially in science, that we have almost broken with the past. Our giant stature has dwarfed for us the preceding centuries, partly has made us forget our inherited debt and creates an illusion of self-sufficiency that is, perhaps, a little vulgar. Such a condition stirs memory and rouses a sense of danger so that once more it seems as if, in the words of Sir Thomas Browne, " 'Tis opportune to look back upon old times and contemplate our forefathers."

Four hundred years ago science began to divorce itself from the church, up to that time the accepted vehicle of all cultural endeavor. Under its influence thought had become inelastic, dogmatic and altogether removed from practical living. The method of science, dispassionate inquiry into unrelated facts, felt more and more the necessity of separating itself from the rigid formulas of scholasticism, since the latter threatened to blot out its very existence. One of the first effects, as the breach grew wider, was an increasing decentralization of thought and deed. Authority and unity of command meant a stifling of thought, so that every effort was made to escape this on the one hand and, on the other, to strengthen the freedom of action of the individual. In addition, structural thinking was cast overboard, and the experimental method alone came to dominate the field.

The culmination of the movement was seen in the early years of the present century, when the civilized world presented the picture of thousands of widely spread laboratories and clinics in which innumerable investigators were engaged in piling up, with unflagging patience, a staggering array of unrelated facts. At the same time the reaction against authority had reached its height, so that one beheld the spectacle of men who, in contiguous laboratories, and working on the same problem, often resolutely refused to concede even a tittle of merit to each others' efforts. Contempt for precedent and organization led inevitably to this result. In divorcing himself from the past, in working alone, many an investigator and clinician paid the inevitable price of such isolation. His world of mental vision narrowed, healthy skepticism became suspicion, and personal experience, lacking the leaven of a wider culture, instead of serving truth too often resulted in mere prejudice and provincial ignorance. John Hunter's dictum, "Don't think, try," was followed with a thoroughness that unfortunately left little to be desired. Our library shelves sag with the results of this furious pursuit of facts, and while the trying thousands yearly add to the indigestible load, the occasional Pasteur, thinking as well as trying, creates magic. Together with the very real achievements of the few there has thus grown up a great army of little people who, unchastened by the discipline of thought or contemplation of the past, threaten the very science they seek to serve.

Thus we begin to realize that in overthrowing the already accomplished instrument of philosophic method we have, so to speak, thrown away the child with the bath water. We are surrounded with data innumerable and appear unable to synthesize them. The danger is real and the cry for correlation arises from more than one great university. To a large extent, present day investigators and clinicians of the highest type have seen the problem and are facing it. Obviously there are many roads of approach to its solution and of these that of historic method is not the least.

To this end, then, among others, the study of the history of medicine serves splendidly and in its pursuit one may hope not only to relish great minds and great accomplishments, but also, perhaps, to achieve a little humility.

H. LONGSTREET TAYLOR

Some in an early stage of their medical careers have a vision of a goal worth while. Too often distractions cause a letting up in endeavor or a diversion from the chosen path.

Longstreet Taylor became Dr. Longstreet Taylor in 1882, by coincidence the same year that the German physician Dr. Robert Koch made his outstanding contribution to medical science—the discovery of the tubercle bacillus. Dr. Taylor was content with nothing less than a year spent in Berlin under Dr. Koch.

Upon his arrival in Saint Paul in 1893 Dr. Taylor began devoting his energies to the fight against the scourge of tuberculosis, especially in his city and state. Article after article on the subject appeared in the local journal—the Northwestern Lancet. He toured the state in an effort to arouse public interest. He appeared repeatedly before the state legislature. He was the pioneer and the leader in the hard up-hill fight in those earlier days when both the public and the medical profession had to be convinced of the necessity of a departure in methods of treatment of tuberculosis if success was to be achieved. Few knew of his expenditure of energy and time and even of his private means in the pursuit of his main objective—the elimination of tuberculosis.

It was not until the year 1918 that the statistics in this state began to indicate that the foe was beginning to yield. Dr. Taylor lived to see the mortality rate of tuberculosis more than cut in half. With a tireless carrying-on of the work he started there is no reason why this still dreaded disease cannot be practically eliminated just as other similar scourges have.

Dr. Taylor aroused the antipathy of some physicians by his insistence on the necessity of public care of those afflicted with tuberculosis. Experience has vindicated the correctness of his viewpoint. Many were his friends both within and without the profession and many feel the real loss of his going.

MISCELLANEOUS

SOCIAL INSURANCE IS CONTRARY TO THE FUNDAMENTAL PRINCIPLES OF DEMOCRATIC GOVERNMENT*

Edward H. Ochsner, M.D.
Chicago

All forms of Social Insurance are contrary to the spirit of democratic government. They destroy individual incentive, initiative and self reliance. They substitute paternalistic control for independence of thought and action. We pride and congratulate ourselves on living under a democratic form of government but most of us fail to realize that we are slowly but surely drifting away from the true democratic spirit in government —that we are gradually substituting a hybrid form of government, a cross between bureaucracy and socialism. Personally, I am a firm believer in democracy and believe that many of our present ills are the direct result of already having deviated too far from the fundamental principles of democracy.

Individual responsibility is the foundation of democratic government. If a nation does not educate its citizens to individual responsibility, it will soon have no one capable of assuming public responsibility. Slowly through the ages the common man has risen from chattel slavery and serfdom to independence, freedom and personal liberty, and now some well-meaning but misguided people want to undo all this. They want to enslave him again, making him in fact a bondsman of the state. Organized society is forever forging new chains with which to shackle the free development of its members. It is forever meddling with the private affairs of its citizens. One of the best illustrations of this statement is found in a recent survey of the Citizen' Bureau of Milwaukee which found that that city is engaged in approximately three hundred different functions, one-fifth of which have been added during the last sixteen years. Milwaukee is no worse in this respect than many other cities in this country. Add to this the activities of the county, state and federal governments, and we find an explanation of the following fact: "In a period in which the population of the United States has increased ten per cent the number of persons holding civil office has increased forty per cent and the amount paid in salaries has increased one hundred and fifty per cent." Thirty years ago one person in every forty-five was in government employ while now one in every twelve is so employed.

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*One of a series of articles appearing in state medical journals on various phases of socialized medicine.

"It is a profound mystery why the people of the present generation should so violently run after the very things their forefathers so violently ran away from in 1776. One of the chief indictments of King George set forth in the Declaration of Independence reads: 'He has erected a multitude of new offices and sent hither swarms of officers to harass our people and eat out their substance.' "

In a recent article, Dr. Harry Emerson Fosdick makes a statement that seems particularly suitable in this connection. He said, "Many of those in society who are dissatisfied with present conditions know what they want to get away from, but they do not know whither they are going." I would add, "nor do they seem to have any clear idea as to what they want." Before we adopt new laws we should make reasonably sure that such laws will not introduce new and greater evils than they are expected to cure, that they can actually be enforced, and that they are not likely to be abused in their administration.

A far reaching innovation such as Social Insurance must be viewed from many angles. We must consider its effect upon the general public, the insured, the employer, and the medical and dental professions.

If we are deliberately trying to get away from the democratic form of government, having a definite objective in view, and if we are reasonably certain that the goal for which we are headed is worth while and is going to result in general social and economic betterment, an experiment with Social Insurance might be justified, but, even then, it is well to carefully weigh and consider what the wise founders of our government had to say on this important subject. I quote from the Declaration of Independence, "Prudence, indeed, would dictate that government long established should not be changed for light and transient reasons." If we as a nation are just aimlessly drifting, as we seem to be, we are almost sure to get into serious trouble. We believe that we shall be able to show conclusively, in future articles, that in those countries in which it has had prolonged and extensive trial it actually has had serious consequences. These latter problems will be taken up in subsequent articles.

CULTIVATION OF "COMMON COLD" VIRUS

The growing conviction that "common colds" are not due to any micro-organism thus far included in commercial vaccines, but to an unknown filtrable virus or group of viruses, is strengthened by the currently reported successful cultivation of bacteria-free pathogenic nasal filtrates. The work indicates conclusively that the filtrable agent associated with "common colds" multiplies or is multiplied in the embryonic tissue medium. (Jour. A. M. A., August 15, 1931, p. 466.)

OBITUARY

John Benson Brimhall

1862-1931

Dr. J. B. Brimhall, Saint Paul, was born July 4, 1862, on a farm located now within the city limits of Saint Paul between Randolph and St. Clair, Snelling and Hamline Avenues. Here his parents had moved in 1851.

After attending the public schools in Saint Paul he enrolled in 1886 in the St. Paul Medical College located on West Ninth Street. Upon its discontinuance the next year he entered the University of Pennsylvania medical school, where he graduated in 1890. Upon graduation he opened an office in the Moore Building at Seven Corners, Saint Paul, where he was associated with his friend, Dr. Arthur J. Gillette, for twenty-three years.

During the early years of his practice he was assistant city physician, taught in the Hamline University Medical School, and later was on the teaching staff of the University Medical School. Staff membership included St. Joseph's and St. Luke's hospitals among others.

On January 26, 1891, Dr. Brimhall became a member of the Ramsey County Medical Society and retained his membership in the county, state, and national organizations until his death December 21, 1931.

He was Executive Secretary of the State Board of Medical Examiners from 1897 to 1901 and during this period devoted considerable time to the Legislature in the interests of legislation for the betterment of medical practice.

On September 24, 1890, Dr. Brimhall married Miss Nellie Nabon. A son and three daughters were born before Mrs. Brimhall's death in 1903. Later he married Mrs. Laura Matthews, who, with his three daughters, Mrs. Carlton C. Brainard, St. Paul, Mrs. Oswin Reeves, Minneapolis, and Mrs. Frank Daniels, Long Lake, Minnesota, and one step-daughter, Mrs. Colin MacDonald, St. Paul, survive him.

As a statement in his county society records: "Quiet and unassuming in nature, his record will not be found on the pages of medical journals or textbooks but is graven deeply in the hearts of his friends, and his patients were his friends."

Henry Longstreet Taylor

1857-1932

Dr. H. L. Taylor, Saint Paul, was born in Cincinnati, Ohio, August 14, 1857, and died at his home January 2, 1932, at the age of 74. He attended Haverford College at Haverford, Pennsylvania, and received his medical degree from the College of Ohio, now the University of Cincinnati, in 1882.

It was in 1882 that Dr. Robert Koch discovered the tubercle bacillus and the subject so intrigued Dr. Taylor that he went to Berlin, where he spent a year working with Dr. Koch. The next two years he spent at Prague, and returned to practice in Cincinnati. Poor health necessitated his moving to Asheville, North Carolina, where he practiced for four years, coming to Saint Paul in 1893.

Dr. Taylor joined the Ramsey County Medical Society May 1, 1893, and the same month read the first of a number of papers before the society on the subject of tuberculosis. He became secretary of his county society in 1894 and on retiring in 1895 made a plea for the founding of a medical reference library. Dr. Taylor was appointed on the committee which led to the forming of a library association and eventually to the taking over of the library by the society in 1897.

Interested in tuberculosis from the beginning of his medical career, on arriving in Minnesota Dr. Taylor began a publicity campaign in the interest of antituberculosis fight, making addresses in various parts of the state. His untiring efforts were largely responsible for the authorization of a state sanatorium in 1903 which was opened at Walker in 1907. His private tuberculosis sanatorium at Pokegama, opened in 1905, has the distinction of being the first sanatorium in the state.

In 1906 the Association for the Prevention of Tuberculosis was formed as a private undertaking in Saint Paul and a county tuberculosis camp was established in 1910 at Cuenca on the shore of Lake Owasso. On this property the county Preventorium was later established in 1915.

In 1913 the legislature passed the County Sanatorium Bill which provided state subsidy for county sanatoria. It was not until 1918 that the mortality statistics showed the results of the fight against tuberculosis. But Dr. Taylor lived to see the death rate from tuberculosis more than halved.

Dr. Taylor was one of the members of the first editing and publishing committee of MINNESOTA MEDICINE and served until 1923, when he was appointed Councilor of the State Association. He was president of the Minnesota Public Health Association from 1924 to 1927 and president of the National Tuberculosis Association in 1928. The Trudeau society of Minnesota honored him with a dinner at the time of his presidency in 1926. In March, 1928, a dinner sponsored by the Lymanhurst medical staff was tendered him at the New Nicollet Hotel in Minneapolis.

At the time of his death Dr. Taylor was chairman of the Children's Preventorium and the Pokegama Sanatorium, a member of the Minnesota Club and the Minnesota Academy of Medicine. Surviving him are his widow and three children, Henry L., Jr., Laura and Louise Nicolich of New York.

Dr. Dudley C. Frise

1887-1932

Dr. Dudley C. Frise, of Minneapolis, died unexpectedly Sunday morning, January 10, 1932, while resting after playing two chukkers of polo at Fort Snelling riding hall. Death was due to heart disease.

Dr. Frise had lived in Minneapolis since his graduation from the medical college of Northwestern university in 1904. Previously he had attended the University of Minnesota, where he was the youngest student ever to enter the school of pharmacy. He was born in Hamilton, N. D., in 1887.

Active in civic affairs, Dr. Frise was a member of the Minneapolis Athletic club, president of the Exchange club, a director of the Salvation Army, and the Boy Scout advisory council. He was also a member of the Minneapolis Red Cross chapter, and the Fort Snelling Polo club.

Surviving him are his wife; a brother, Melvin Skews Frise of Minneapolis; a sister, Mrs. T. Arthur Prichard, and two children by a previous marriage, Richard and Geraldine.

Dr. F. G. Watson

1871-1932

Dr. F. G. Watson, 60, a resident of Nobles county for more than twenty years, died at his home in Worthington, Minn., Monday, January 11, 1932, following an illness of nearly two years.

After coming to Rushmore in 1910 Dr. Watson practiced medicine continuously there and in Worthington until January 14, 1930, when he was stricken with a heart attack during an operation. He was then forced to retire and had been in a serious condition since.

Frederick Goodwin Watson was born in Ireland, December 23, 1871. He came with his parents to New York in 1884 and after spending a summer in New York, they moved to western Canada, locating on a farm 125 miles west of Winnipeg. He took up the study of pharmacy in 1890, attending the University of Manitoba. In 1896 he came to Wood Lake, where he opened a drug store. During McKinley's administration he was postmaster there.

In the fall of 1898 Dr. Watson took up the study of medicine at Hamline university. After completing the medical course there he located at Clarkfield, where he practiced medicine and conducted a drug store.

In 1910 he moved to Rushmore and remained there until 1918, when he came to Worthington, associating himself with Dr. B. O. Mork. They operated the old Humiston hospital under the name of Mork & Watson. In 1920 they organized the Worthington Clinic. Dr. Watson was active in interesting other men in the Clinic and in the construction of the office building.

In 1921 Dr. Watson took post-graduate work in Chicago and at Tulane university in New Orleans.

He married Miss Isabelle A. Tibbils on September 1, 1897, and to them five children were born: Horace Percy Watson of Worthington, Dr. Leo Watson of Parkersburg, Ia., Dr. Sidney J. Watson of Worthington, Donald G. Watson of Worthington and Mrs. Bernice Ann Maxwell of Sioux Falls. The children and Mrs. Watson survive, as do also one sister, Mrs. R. S. Butchart of Greensboro, N. C., and two brothers, James Watson of Minneapolis and Ernest Watson of Wauwatosa, Wis.

OF GENERAL INTEREST

The Brigham hospital at Watkins, Minnesota, has been reopened for patients due to the numerous calls for hospital service in the community. Dr. F. T. Brigham is in charge.

Dr. C. Oliver Heimdal, formerly a fellow in surgery at the Mayo Clinic, was elected secretary and treasurer of the Aurora (Illinois) Medical Society at their last meeting.

Dr. Byron O. Mork, Jr., graduate of the University of Minnesota Medical School in 1930, spent the past year as interne at the Receiving Hospital, Detroit, Michigan, and is now associated in practice with the Worthington Clinic, Worthington, Minn.

Paul Fesler, superintendent of University Hospital, Minneapolis, has accepted the superintendency of Wesley Hospital, Chicago, affiliated with Northwestern University. Appointment of a successor to Mr. Fesler has not yet been made.

Dr. Louis B. Wilson, Director of the Mayo Foundation of the University of Minnesota, was recently elected President of the Association of the American Medical Colleges. More recently also he has been elected National President for two years of the Society of the Sigma Xi.

The John Phillips Memorial Prize of the American College of Surgeons for 1931 consisting of the sum of $1,500 has been awarded to Dr. O. T. Avery of the Rockefeller Institute, New York City, for his series of studies on the pneumococcus. The award will be made at the meeting of the College at San Francisco in April.

Dr. B. F. Van Valkenburg, Long Prairie, was elected president of the Minnesota State Sanitary Conference at its annual convention in December. Dr. W. H. Valentine, Tracy, was named vice president; Dr. A. J. Chesley, Minnesota State Board of Health, secretary-treasurer. Drs. George Wattam, Warren, and H. M. Workman, Tracy, were elected life members.

Dr. Edward Bratrud of the Bratrud Clinic, Thief River Falls, has recently added to his Staff Dr. Lucien G. Culver, recently associated with Drs. Wheeler, Larson, and Wold at St. Paul in the practice of Eye, Ear, Nose and Throat; also Dr. Charles W. Froats, who recently completed a two years' Fellowship in Gynecology and Obstetrics at the University of Minnesota.

The fourth annual high school Gorgas Essay Contest for high school juniors and seniors, sponsored by the Gorgas Memorial Institute, Washington, D. C., will open February 7 and close March 15. The subject of the contest is "Mosquitoes, Their Danger As a Menace to Health and the Importance of Their Control." High school winners will qualify in the State Contest, the prize to be $10 in cash, and state winners will be entitled to enter the National contest, with a prize of $500 in cash and a travel allowance of $200 to Washington. Detailed information may be obtained by writing to Gorgas Memorial Institute, 1331 G Street N. W., Washington, D. C.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

CANCER "SPECIALIST" LEAVES STATE FOLLOWING $1,000.00 FINE

State of Minnesota *vs.* Boyd T. Williams

On Saturday, December 19, 1931, Boyd T. Williams, who for twenty years has maintained a cancer sanitarium in Minneapolis and in recent years at 525 University Ave. S. E., was sentenced to pay a fine of $1,000.00 or to serve one year in the Workhouse in the City of Minneapolis, by the Honorable Arthur W. Selover, Judge of the District Court of Hennepin County. Williams paid the fine.

Defendant had been under arrest for some time following the filing of a complaint against him by Mr. Brist, representing the State Board of Medical Examiners. Williams was charged with practicing healing without a Basic Science Certificate. When Williams was brought before the Court to receive his sentence he informed the Court that he had closed his place and had removed his sanitarium to Hudson, Wisconsin, which fact has been verified by the State Board of Medical Examiners.

This is the third time that Williams has been convicted of violating the Medical Laws of this State since the enactment of the Basic Science Law in 1927. In 1913 Williams was fined $50.00 by the Municipal Court of Minneapolis for practicing medicine without a license. In 1928 he paid a $100.00 fine for practicing without a Basic Science Certificate. In 1929 he paid a fine of $250.00 for a like offense.

The closing of this case and the removal of the defendant to Hudson, Wisconsin, should mark the end of Williams' practicing in Minnesota without a license.

ANNUAL SECRETARIES CONFERENCE

A record making attendance of close to one hundred physicians and others registered for the Annual Secretaries Conference of the Minnesota State Medical Association, Saturday, January 23, at the St. Paul Hotel in St. Paul.

The program, scheduled to last until 4 P. M., was prolonged until 6 P. M. to give time for discussion.

The three major events of the morning program included discussions of fee collection methods led by Mr. Albert Wilson of St. Paul; a recital of the work of the joint coöperating committees of the Minnesota Editorial and the Minnesota State Medical Association by Mr. Roy J. Dunlap, Managing Editor of the St. Paul Pioneer Press and Dispatch, and J. A. Watson, chairman of the Medical Association Committee, Minneapolis, and a symposium on Medical Care of the Poor under the chairmanship of Dr. Theodore Sweetser, Minneapolis, chairman of the State Health Relations Committee. W. C. Andrews, Frederic, Wisconsin, president of the Polk County Medical Society; Mr. Vernon D. Blank, Des Moines, general manager of the Iowa State Medical Society, and Dr. Harold M. Camp, Monmouth, Ill., secretary of the Illinois State Medical Society, reported on the systems in use in their respective states. The Hon. Henry Benson, Attorney General, commented upon possibilities of introduction into Minnesota of the contract system in use in Iowa and elsewhere for care of the poor.

The luncheon address on the subject "The County Society Turns the Tide against State Medicine," was made by Mr. H. Van Y. Caldwell, Cleveland, executive secretary of the Cleveland Academy of Medicine, with a discussion by Mr. Theodore Wiprud, executive secretary, Milwaukee County Medical Society.

The afternoon program was devoted exclusively to Periodic Medical Examinations and Medical and Hospital Care for Veterans, the latter occupying the major portion of the time.

Dr. C. A. Hensel, St. Paul; Dr. C. B. Wright, Minneapolis, and Dr. M. C. Piper, Rochester, discussed advisable extent and methods of public education for the periodic health examination.

Dr. Otho A. Fiedler, Sheboygan, Wis., president of the Wisconsin State Medical Society, outlined the history of the Shoulders Resolution for substitution of disability insurance for further government hospital building for veterans. A two-hour discussion of the situation followed, led by Dr. C. B. Wright, chairman of the Legislative Committee of the American Medical Association; Mr. Paul Fessler, president of the American Hospital Association; Dr. Herman Johnson, chairman of the Committee on Public Policy and Legislation; Dr. N. G. Mortenson, formerly president of the Forty and Eighter; Dr. James J. Morrow, former Vice Commander of Minnesota American Legion, and Dr. H. R. Tregilgas, South St. Paul.

Many out-of-state visitors to the conference remained to take part in the Annual Northwest Regional Medical Conference which met informally Sunday, January 24, at the St. Paul Hotel. Nine states were represented at this conference and more than fifty were registered in attendance in the course of the day. Sessions began with breakfast meeting at 8 A. M. and continued until 5:30 in the afternoon.

Among those who attended the meeting were Dr. Otho A. Fiedler, Sheboygan, Wis., president of the Wisconsin State Medical Society and retiring president of the Conference; Mr. Vernon D. Blank, general manager of the Iowa State Medical Society, secretary of the Conference; John L. Marker, Davenport, Iowa; Dr. L. R. Woodward, Mason City, Iowa; Dr. D. J. Glomset, Des Moines; Dr. R. W. Fouts, Omaha, Neb.; Dr. B. F. Bailey, Lincoln, Neb.; Dr. George Crownhart, Madison, Wis.; Dr. Earl Whedon, Sheridan, Wyo.; Dr. Harold M. Camp, Monmouth, Ill.; Dr. R. G. Leland, Chicago; Dr. J. F. D. Cook, Langford, S. Dak.; Mr. H. Van Y. Caldwell, Cleveland, Ohio, and Mr. Theodore Wiprud, Milwaukee.

Minnesota representatives who attended the conference were Dr. E. A. Meyerding, St. Paul; Dr. C. B. Wright, Minneapolis; Dr. M. S. Henderson, Rochester; Dr. W. F. Braasch, Rochester; Dr. Herman Johnson, Dawson; Dr. H. M. Workman, Tracy; Dr. George Earl, St. Paul.

Medical economics, care of the indigent, lay health education methods and the budgeting of medical publications were discussed at length in the course of the day.

Dr. Cook was elected president of the Conference to succeed Dr. Fiedler. Mr. Blank was re-elected secretary. St. Paul was chosen again as next year's meeting place.

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Del Maiz Niblets Brand (Minnesota Valley Canning Company, Le Sueur, Minn.).—A "vacuum" packed canned whole-kernel corn containing no added salt or sugar and very little added water. It is claimed to be the canned whole kernels of a special breed of corn packed in vacuum to protect the flavor and processed with only a small amount of added water to retain the form of the original kernels.

Green Giant Brand Great Big Tender Peas (Minnesota Valley Canning Company, LeSueur, Minn.).—Canned ungraded "fancy quality" Green Giant variety peas sweetened with sugar and seasoned with salt. This product is claimed to make an appetizing and easily digestible purée for infants.

SMACO (200) Whole Milk Sterilized (S. M. A. Corporation, Cleveland, Ohio).—A canned sterilized homogenized whole milk. It is recommended for all uses of whole milk and especially for infant feeding. (Jour. A. M. A., September 12, 1931, p. 780.)

Harvest Bread (Hecht's) (Hecht's Bakery, Bristol, Tenn.).—A white bread made by the sponge dough method. It is claimed to be a bread of good quality. (Jour. A. M. A., September 19, 1931, p. 853.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of February will be as follows:

February 3—Personal Hygiene—Food Selection.
February 10—Buerger's Disease.
February 17—Prevention of Goiter.
February 24—Is Cancer Inherited?

AMERICAN COLLEGE OF PHYSICIANS

The sixteenth annual Clinical Session will meet in San Francisco the week of April 4, 1932. General Sessions will be held each afternoon, Monday to Friday inclusive and Monday and Tuesday evenings. Clinics and demonstrations will occupy the mornings.

The subjects to be emphasized will be the recent contributions to the fields of arteriosclerosis, hypertension, nephritis, the autonomic nervous system, gastrointestinal physiology, hematology, and diseases peculiar to the Rocky Mountain and Coast territory.

All physicians in good standing are invited to attend. The guest fee of $15.00 includes one year's subscription to the Annals of Internal Medicine, the official journal of the college. Entertainment will be provided by the local committee for members of the families of those who attend.

Dr. S. Marx White, Minneapolis, is president of the organization this year and Dr. George Morris Piersol, Philadelphia, is secretary-general.

STATE MEETING

A program full of novelties and innovations is in process of completion for the 79th meeting of the Minnesota State Medical Association, which is, this year, to be held concurrently with the Minnesota Hospital Association at the new Saint Paul Auditorium, May 23, 24 and 25.

The Committee on Scientific Assembly wrestled for hours at its meeting January 16 at the Saint Paul Athletic club with the no less than 904 subjects suggested by the membership in an astonishingly large reponse to the questionnaire on scientific program sent out after the first meeting of the committee.

To comply with the largest possible number of these requests, the program is to be divided in an entirely unprecedented fashion. Table demonstrations for small groups will vie for time with the larger medical and surgical sectional meetings and the general meetings to be addressed by distinguished out-of-state guests.

In order to arrange discussion and demonstration of as many of the requested subjects as possible within the limited available time the committee has decided to hold table demonstrations during three program hours of the session: from 10 to 11 a. m. Tuesday, from 2 to 3 p. m. Tuesday, and from 10 to 11 a. m. Wednesday. Twenty of the best qualified men in the state will preside at these demonstrations, which will be carried on, round table fashion, for small interested groups in the large exhibit hall. The scientific and technical exhibits on display in the hall will afford ample material to interest those who do not attend the demonstrations. Subjects already suggested for these latter include fungi; Ascheim-Zondek test; electrocardiograph; undulant fever; allergic skin tests; urine typing of pneumonia; X-ray of juvenile tuberculosis; gallbladder technic; tuberculin test; Schick test; blood sugar; blood urea; albuminuria; arthritis skin test; cauterizing the cervix; brain model; localization; X-ray of ulcers; eye grounds.

The large joint sessions of the program will be confined to Monday afternoon, Monday evening and Tuesday and Wednesday from 11 to 12 a. m. and from 1 to 2 p. m.

Medical and surgical sections will meet separately Tuesday and Wednesday mornings from 8 until 10 a. m. The entire series will close Wednesday afternoon with a program of interesting short clinics, all to be held at the Auditorium.

Among the interesting guests speakers already secured by the committee for the meeting is Walter Sebening of the University of Frankfort, Frankfort on the Main, Germany. Dr. Sebening is completing six months of research on peptic ulcer at American medical centers, a subject on which he has done important work in Germany. He will report on his findings as one of the major program features of the meeting. Carter Wood, Columbia University, will talk on some phase, yet to be decided, of the cancer problem; Theodore M. Davis, Greenville, S. C., will explain a new and simple method of prostate resection with illustrative moving pictures and discussion by notable Minnesota urologists; Willis C. Campbell of Memphis, Tenn., will speak on some phase of industrial surgery, illustrating his talk with moving pictures; Ralph Major, Kansas City, will talk on hypertension.

For the Wednesday afternoon clinic the following subjects have been tentatively selected: blood, goiter, heart, kidney, epilepsy, diabetes, neurology, dermatology, mastoids, urology, poliomyelitis, eczema, periodic health examination.

Any members possessing moving pictures of scientific or technical interest to the medical profession are especially requested by Dr. W. A. O'Brien, chairman of the Committee on Scientific Exhibits, to write him about them, giving title, size and length. The films will be used to create a continuous moving picture show on the stage of the exhibit hall during the meeting.

Women of the Hospital Association have been extended an official invitation from the Women's Auxiliary of the medical association to meet with them during their two day annual meeting scheduled for Tuesday and Wednesday, May 24 and 25. An unusual and especially attractive number of social affairs is being arranged for the augmented meetings.

FRACTURE SYMPOSIUM

The Minneapolis Surgical Society and the Regional Sub-Committee of the Committee on Fractures of the American College of Surgeons will jointly conduct a symposium on fractures on February 3 and 4.

The first meeting will be under the direction of the Fracture Committee and will be held in the auditorium of the Hennepin County Medical Society at 8 p. m., February 3. At that time the subject of fractures in general will be discussed by representatives of the hospitals and the University of Minnesota.

On Thursday, February 4, Dr. Kellogg Speed of Chicago will be the guest of the Minneapolis Surgical Society. He will give a clinic with demonstration of cases at the Minneapolis General Hospital at 10 a. m. He will speak to the medical students at 2 p. m. in the Todd Amphitheater of the University Hospital.

The annual formal meeting and banquet of the Minneapolis Surgical Society will be held at the Nicollet Hotel, February 4, 6:30 p. m. Following the banquet Dr. Speed will deliver the annual address.

All these meetings are open to all members of the profession in good standing. Reservations for the banquet must be made with the secretary, Dr. H. O. McPheeters, Atlantic 5579, before 5 p. m., February 3.

Banquet tickets $2.00.

RICE COUNTY SOCIETY

The annual meeting of the Rice County Medical Society was held Wednesday, December 16, 1931, at 6:30 p. m., in the Main Hall at the State School for Feeble-Minded.

Dinner was served at 6:30 p. m. by Dr. and Mrs. J. M. Murdoch. The doctors' wives, local nurses and the Auxiliary were invited.

Following the dinner an entertainment was given by the children of the school. Addresses were made by Dr. J. M. Murdoch, president of the society; by Mrs. M. L. Mayland, president of the local auxiliary; and Dr. C. F. McClintic, Williamsburg, West Virginia, Professor of Neurology and Chief of the Department of Anatomy at the Detroit College of Medicine and Surgery, spoke on the subject of Headaches.

C. J. Plonske, *Secretary.*

RED RIVER VALLEY SOCIETY

The annual meeting of the Red River Valley Medical Society was held December 8, 1931, at the Hotel Crookston, Crookston, Minn. A banquet was served at 6:30 P. M. with guests, friends, and ladies of the auxiliary.

The scientific program consisted of the following:

1. "Presentation of Some Bone Lesions in Children."
   Lyle L. Brown, Crookston.
2. "The Management of Mastoiditis."
   J. G. Parsons, Crookston.
3. "Cancer of the Skin." Presented as a moving picture—courtesy of the Committee on Prevention of Cancer.

At the business meeting following the scientific session the following were elected as officers for the coming year: President, Dr. O. F. Mellbye, Thief River Falls; vice president, Dr. H. H. Hodgson, Crookston; secretary-treasurer, Dr. C. L. Oppegaard, Crookston; censor, Dr. H. H. Holte, Crookston; delegates, Dr. H. M. Blegen, Warren, and Dr. O. E. Locken, Crookston; alternates, Dr. O. J. Engstrand, Warren, and Dr J. F. Norman, Crooksotn.

C. L. Oppegaard, M.D.
Secretary-Treasurer.

SCOTT COUNTY SOCIETY

The December meeting of the Scott-Carver County Medical Society was held at the Broz Hotel at New Prague, December 8, 1931. H. M. Huenekens, Minneapolis, spoke on "Abdominal Pain in Infancy and Childhood"; Walter H. Ude, Minneapolis, on "The Diagnosis of Early Pneumonias with X-ray."

At the invitation of P. M. Fischer, Shakopee, it was decided to hold the next meeting of the society at Shakopee.

Boehler's technic in reducing fractures was discussed at the November meeting of the society, also held at the Broz hotel in New Prague. R. R. Cramer of Minneapolis spoke. A. C. Strachauer, Minneapolis, showed some interesting motion pictures taken in India in the course of a recent world tour.

WASHINGTON COUNTY SOCIETY

The meeting of the Washington County Medical Society, held November 10, 1931, at Stillwater, was of outstanding significance to the society, as we are about to launch on a new enterprise. We have for some time endeavored to align ourselves with the different activities devoted to the health of pre-school and school children, by giving examinations and tests, to give the protection to which a growing generation undoubtedly is entitled. From the start we have held this to be a very worth while insurance and therefore worth at least a nominal fee. We have and do insist on a fee, no matter of what size. We feel the medical profession has been and is continually asked to do altogether too much for charity. This Society has placed itself on record as willing, at all times, to render free service where it is actually needed, and without a murmur. However, this Society is also very anxious to act as a strong retention wall to help stem this tide of charity demand that is trying to engulf us from all sides. No other class or individuals are so persistently being made the target for charity seekers, societies or other combinations that would profit or be credited with, or able to further some project of their own by charity work done by the regular medical profession. We also believe that too much charity paves, or helps pave, the way for a very undesirable thing "STATE MEDICINE."

We have about completed arrangements for giving the Mantoux test to Junior and Senior students at our High School for a small fee. This will be our first step in the care tendered our school children as a society.

We have been slow in arriving so far, but we are slow so that we may avoid mistakes, and be able to profit by those made by others. We have sought, through our County Health Relations Committee and others, information from other sources helpful in this work. At this meeting Dr. Everett Geer, of Saint Paul, was specially invited to go over our plans with us, and Doctor Geer certainly gave us unstinted measure of his substance. As a result we now feel well prepared to go ahead with some benefit to ourselves and more so to those more chiefly concerned—the school children. In holding out for a fee for our work, we feel we are helping to fight a battle, the winning of which is of outstanding importance to every regular practitioner in the United States.

E. SYDNEY BOLEYN, M.D., *Secretary.*

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

RICE COUNTY AUXILIARY

Dr. and Mrs. J. M. Murdoch entertained the Rice County Medical Society and the Medical Auxiliary at the annual dinner on the evening of December 16 at Faribault. Following the banquet an interesting program of music, dances, and a short play, was given by the children of the State School.

The meeting was then opened by Dr. J. M. Murdoch, president of the Rice County Medical Society.

Mrs. M. L. Mayland, president of the Auxiliary, told of the work the Auxiliary is doing, in the making over of clothing for the needy.

Dr. C. F. McClintic, of Williamsburg, W. Va., gave a very interesting talk on headaches.

The rooms were beautifully decorated with Christmas greens, and about one hundred guests were present.

STEARNS-BENTON MEDICAL AUXILIARY

Mrs. George Mosby was hostess to the Stearns-Benton Medical Auxiliary on December 4. At this meeting $10 was voted to the Minnesota Public Health Association.

WASHINGTON COUNTY AUXILIARY

On January 5, at a social meeting of the Washington County Auxiliary, it was voted that the money from the benefit bridge held in the Spring, with the addition of $9.00 already in the treasury, be used for installing a long needed drinking-fountain in the hospital.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of November 11, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 11, 1931. After dinner at 7 o'clock, the meeting was called to order by the President, Dr. J. S. Gilfillan, at 8 o'clock.

There were 55 members and 2 guests present.

Minutes of the October meeting were read by the Secretary and approved as read.

Dr. William Davis read, for the Necrology Committee, the following memorial to Dr. H. J. O'Brien, and a motion was carried that this be placed in the permanent record of the Academy and a copy sent to the family of Dr. O'Brien.

DR. HENRY J. O'BRIEN
1862-1931

Joining the Academy in 1906, Dr. O'Brien was one of the older men both in membership and in age, as he was in his seventieth year at the time of his death, which occurred on September 16 last after an illness of only four days.

Born in the neighboring state of Wisconsin on April 21, 1862, he was brought to Minnesota in his early childhood and, after a general education in both parochial and public schools, he entered the Medical Department of the University of Pennsylvania, from which he received the degree of M.D. in 1888, beginning at once the practice of his profession.

Most of the limited surgery of that day was in the hands of a few general practitioners, one of whom, in St. Paul, was the late Dr. Everton J. Abbott, with whom Dr. O'Brien formed an early association. From the experience and instruction gained as Dr. Abbott's assistant, he soon developed an aptitude for surgery that in later years warranted his limiting his practice to that branch.

At this day it is not easy to realize the difficulties of those who fitted themselves to become experts in surgery at the time when the development of aseptic technic was adding in rapid succession one area of the body after another to the fields for legitimate surgical operation. These men had to learn everything for themselves for there was no one to teach them. Of this growth of surgery Dr. O'Brien was a part. He was recognized as belonging to the first rank of surgeons in the locality in which he practiced.

One of his most striking characteristics was his willingness to undertake some of the almost forlorn hopes of surgery. Where operation was the only chance, no matter how slender that chance might be, he was ready to give the patient the benefit of it, regardless of injury to his own surgical reputation by the probable failure. This was a part of a generous and unselfish nature which manifested itself in innumerable instances in his private as well as in his professional life. No deserving person who appealed to him for help of any kind was ever turned away.

Dr. O'Brien was a delightful companion. To a keen sense of humor and a ready wit was added the ability to describe any happening in a most entertaining way and to make the most of its interesting features. He will be missed sadly from our gatherings.

Your committee recommends that this memoir be included in the records of the Academy and that a copy of it be sent to Dr. O'Brien's family.

(Signed) E. M. Jones,
C. C. Chatterton,
Wm. Davis, Chairman.
The Committee.

The scientific program consisted of the following:

Dr. Emil S. Geist (Minneapolis) presented two patients on whom he had operated for Tuberculosis of the Tarsus. Dr. Petter, of Glen Lake Sanatorium, by invitation, showed X-ray lantern slides of these before and after operation.

About the middle of the last century Ollier performed and described a block resection of the tarsus in the case of tuberculosis of these bones. Several years ago I did this operation with good results and have since added two more cases, in my private practice, with three additional cases which we have done at Glen Lake Sanatorium.

The cases which I wish to present show perfect results with the type of operative treatment mentioned, while each patient has a different area of the tarsus involved.

Case 1.—E. H. This little girl presented involvement of the anterior part of the os calcis and posterior part of the cuboid, at the age of three years. Under routine sanatorium care plus fixation and heliotherapy for two years, the general condition improved but bone destruction occurred between the astragalus and scaphoid. Resection through the anterior portion of the os calcis and the astragalus, and through the cuneiforms and cuboid was performed on October 16, 1929. On January 9, 1930, a brace was applied, the child having been walking in a Böehler cast for about a month. She was discharged August 12, 1930. As you see, her foot is a bit shorter than the unaffected one. She walks well and has a good functioning member, two years following resection.

Case 2.—V. M., female, aged twenty-three. This patient presented a lameness and soreness over the dorsum of the right foot for one year before definite bone pathology was demonstrable. Finally an X-ray film revealed an infectious process between the scaphoid and cuneiforms which was thought to be tuberculous in nature. On April 8, 1930, an Ollier resection was done through the neck of the astragalus and calcaneocuboid joint proximally and through the cuneiforms and the cuboid-metatarsal articulation distally. The distal segment of the foot was drawn up and fastened to the os calcis and astragalus with heavy chromic gut. Six weeks postoperative a Böehler cast with stirrup was applied and the patient was allowed to walk. The brace was applied in October and the patient was discharged. As you can see, there is definite shortening of the foot but the function is good.

Case 3.—Mr. E. H., male, aged fifty-two. A typical Ollier resection was also done here. Healing occurred quite rapidly and the patient has now been ambulant for one year since the operation.

DISCUSSION

Dr. Arnold Schwyzer (St. Paul): It is a little over 30 years ago that a man came to my office with a foot that was at least twice the size of the normal one. He had tuberculosis of the tarsus. He was 18 years old at the time. We incised on the sides of the foot and scooped out the tarsal bones, leaving only a little of the shell of the bones. Of the astragalus, we removed the head and neck part, the cuboid scaphoid and cuneiform were scooped away, leaving only a partial shell. Iodoform was put in and the skin closed tight after the foot had been somewhat crushed together into a more normal form. There was fine primary healing. After about a year he came in again one day walking with crutches and with a foot swollen up as large as it had been before. I was utterly chagrined when the man came in in this bad shape. The patient, noticing this, said that the foot I had operated before was the one he was walking on now, and that the trouble was now in the other one. I operated upon this foot in the same way. Two or three years ago he brought his wife to our office for an operation and he told me he had never had any trouble with his feet for all these years.

These cases show how in tuberculosis of the foot, if the general condition allows it, you can get very gratifying results from conservative surgery in the young.

Dr. Moses Barron (Minneapolis) read his inaugural Thesis entitled "The Importance of Hepatomegaly and Splenomegaly in Differential Diagnosis." Lantern slide charts were shown.

DISCUSSION

Dr. S. Marx White (Minneapolis): This paper ought not to go without some discussion because with an enormous amount of work and detail Dr. Barron has taken a great deal of dead material and made it into a living study for physicians. I don't know of any other study like it. I think it is not necessary to comment on his conclusions. He has brought out and made clear the limited character of the material. In this climate and latitude many of the diseases causing hepatic and splenic disorders are rare, consequently are not present in representative amount. Within the limitations of the material, therefore, this analysis is useful to the clinician in the terminal stages of the disorders he has analyzed.

Dr. R. E. Scammon (Minneapolis): I wonder if, on behalf of those who are interested in the study of quantitative anatomy, I may express my appreciation of this paper. Those of us who are engaged in this kind of work have always felt the need of a study of this kind on borderline cases made by one with clinical experience.

Dr. Barron has spoken of the effect of blood content. So far as I know, the only work in this line was done a good many years ago by Sappy, who tied off the veins and arteries of the liver immediately after death and found that the liver weights thus obtained were about 200 grams above his controls, an increase of about one-seventh or one-eighth in the weight of the organ. So far as I know, no one has determined experimentally how much blood there is in the average spleen at autopsy. Dr. Barron's work indicates that the changes in spleen weight that may be produced by pressure of neoplasms on the splenic vessels are considerable.

I was very much impressed by the effect of subacute endocarditis on the weight of the spleen. For some years, in gathering supposedly normal spleen weights in children, we watched the records carefully for references to heart disease, and threw out all spleen cases with heart disease. Apparently, from Dr. Barron's work, we were justified in this procedure. It is interesting that Dr. Barron did not get any of these extreme splenic weights in gastroenteritis. I have always questioned the work of Stricker on this subject.

I was also very much interested in the weights Dr. Barron obtained in cases of accidental death. I wonder if we must revise our concepts of the normal weights of most viscera in much the same way as we have those of the thymus. Up to a few years ago we were describing hypertrophied thymi as occurring in cases of sudden death, and it was not until Hammar's work on cases of sudden death of known cause that we discovered our concepts of the weight of this organ were really based upon cases in which hunger atrophy had occurred.

Contributions of this kind will enable us to establish an adequate metric description of the human body.

Dr. C. B. Wright (Minneapolis): I want to congratulate Dr. Barron on this careful paper which bears out our impressions and conforms to the literature on this subject, namely, that malignant livers become very large before death and that leukemia is the common cause of large spleens. There are, however, many conditions such as cyst and cirrhosis which do produce large livers. Rolleston reports a cirrhotic liver that weighed 7,000 grams, in an alcoholic. The conditions that Dr. Barron describes are end-results of disease. From the clinical standpoint our greatest concern is in the *early* recognition of conditions of this kind. The difficulties in the early recognition of enlarging livers and spleens are many, such as thick abdominal walls, ascites, muscle rigidity, etc. However, this does not detract from the interest of the paper pathologically.

Dr. Barron (in closing): I wish to thank those of you who have so kindly discussed this paper. Dr. Scammon's remarks were especially interesting and they make me feel all the more the value of the study which I am now pursuing.

In regard to the question about the spleen in goiter, it is possible that one or two cases were encountered with large spleens but because of the rarity of the condition they may have been placed under the miscellaneous group. In the study now in progress there is a special group under goiter and this will probably bring out the variations in the size of the spleens. With reference to Dr. Wright's remarks, what I said in the beginning of my paper bears very pointedly on this subject. In the present study I have excluded all the questionable sizes and those that are just barely palpable. Most of the discussion centered on the definite hepatomegalies and splenomegalies where the livers weighed over 4,000 grams and the spleens over 600 grams. As you noticed, the organs that fell below these figures might be encountered under a large variety of conditions.

Dr. A. E. Wilcox (Minneapolis) reported three cases of Acute Abdomen Complicating Pregnancy, as follows:

Abdominal operative procedures during pregnancy generally are looked upon with great misgivings and considerable concern. However, there are certain definite emergencies complicating pregnancy which demand surgical intervention. Such surgical conditions may be classified as follows:

(a) The acute abdominal conditions.
(b) Pathological processes which later in pregnancy may interfere with labor, such as ovarian cysts.
(c) Pathological conditions which if allowed to progress awaiting delivery become unmanageable or threaten life, such as acute inflammatory processes.

The following three cases which are here reported come under the first class, namely, the acute abdomen. All were of extreme gravity and of a dramatic nature, requiring immediate operative treatment, and followed by as gratifying and successful results as could be expected in parallel cases occurring in the non-pregnant woman. When an "acute abdomen" develops during pregnancy a critical period is present. Loss of time in needless methods of investigation may be the deciding factor in mortality. I do not believe that too much stress should be laid upon the desirability of detailed diagnosis. The fact that an acute abdominal condition is present is sufficient. A tragedy has occurred which needs immediate and experienced attention. The general practitioner when confronted by such conditions need not feel humiliated by not carrying the diagnosis further. When surgical consultation and interference is sought, and this should be done as soon as possible, the combined conscientious effort should be to attempt to arrive at as correct a diagnosis as possible, yet under the most favorable conditions the acute abdomen will continue to remain only too frequently a mystery until the peritoneal cavity is explored.

Case 1.—Mrs. M., aged twenty-seven, seven and one-half months pregnant. About one month before admission, the patient had experienced some pain, rather severe in character, in the left lower quadrant of the abdomen. The pain was "shooting" in character and referred to the left shoulder. There was nausea, but no vomiting. Upon the day of admission she had been seized with severe pain in the lower mid-abdominal region, "cutting" in character, radiating to the left shoulder. Hypodermics of morphin failed to relieve the pain. Her doctor viewed her condition as one of acute abdomen. Upon admission to Eitel Hospital, January 30, 1930, her temperature was 98°, pulse 72, blood pressure 118/78, respiration 18, and leukocyte count 16,800. The abdomen was enlarged, compatible with a seven and one-half months' pregnancy, there was extreme tenderness on the left side, and marked rigidity elicited by palpation. Previous history and other physical examination was negative. A provisional diagnosis of acute abdomen was made, and while obstruction of the bowel was considered, no detailed definite diagnosis was ventured.

A left rectus incision was made. No free fluid was present in the abdomen. The uterus was smooth and enlarged nearly to term. There were two small fibroids on the posterior wall of the uterus. Adnexæ were normal. The omentum and mesentery of the bowel, small and large, as well as the epiploic appendages, showed white tubercles suggesting grossly either tuberculosis or fat necrosis. In the left epigastrium a mass about the size of a large lemon was felt which subsequently appeared to be the base of a volvulus or mesenteric thickening and the mesentery at this point was edematous. The first appearance of the small bowel was that of collapsed bowel, but on further evisceration the upper portions of the jejunum were dilated and cyanosed. This was followed down to the mass above mentioned and when the mesentery was untwisted, the color immediately returned in the bowel. No other pathology was found. The wound was closed with plain catgut, reinforced with chromic, interrupted and continuous in the fascia, silkworm close together and dermal for the skin. Post-operative diagnosis was volvulus of the jejunum complicating pregnancy.

Recovery was complicated by some nausea, inability to void, and the inevitable "gas pains." However, there was no alarming rise in temperature, or irregularity of pulse and respiration. Fifteen days after the operation the patient went into labor and was delivered by forceps without laceration. The child, a six-pound girl, lived and the mother made an uneventful recovery.

Case 2.—The following case presented an acute abdominal emergency immediately following labor.

Mrs. D., aged twenty-four, whose present complaints were abdominal distention, abdominal pain, weakness, vomiting, and inability to urinate. Labor pains began Friday, March 21, about 8 p. m. The pains were not severe. The membranes had ruptured two days before. The patient says she did not pass her urine Friday night after the pains began. About 11 p. m. Friday she complained of nausea and vomited, then went back to bed and was awakened at 2:30 by sharp pains. She thinks that at 3 a. m. the pains got much worse and she says she felt as though something broke. The doctor arrived at 3:30 a. m. The baby was delivered at 4:30 a. m., weight 7 pounds, normal, no instruments used. The placenta came normally, and there was normal flow. She says she had no pain after delivery. About 8 a. m. she started to vomit. She could not even retain water. There was no blood at first. The doctor came at 2 p. m. because of abdominal distention and continued bloody vomiting. She had not voided, but the bowels had moved. The doctor then catheterized the patient and 350 c.c. of bloody urine was obtained. The patient stated she noticed her heart pounding and distention of the abdomen was increasing rapidly.

Upon admission to the hospital the patient was slightly cyanosed, blood pressure 130/78, pulse 140, temperature 100.9°, respiration 28. Examination of the abdomen revealed fullness in the left lower lumbar region. It was difficult to make a fluid wave, there was no spasm or rigidity, and no vaginal bleeding. The patient was catheterized and 400 c.c. of dark brown reddish urine obtained and, upon pressure below the ribs and in the lumbar region, an additional 250 c.c. of the same colored urine was obtained per catheter. Microscopic examination showed blood cells and many crenated cells.

The presence of the blood in the urine obtained by a catheter, the abdominal distention, rapid pulse, and the expression of additional urine by pressure upon the abdomen suggested an injury in the genito-urinary tract and a tentative diagnosis of ruptured bladder was made.

The abdomen was opened and free bloody fluid escaped. The uterus was well contracted and free of adhesions. The bladder was drawn up and on its superior lateral surface a rent was found about two inches long. The bladder mucosa and walls were apparently normal. The bladder mucosa was repaired with plain catgut and reinforced with a layer of Dulox and several individual sutures to take off the strain. The wound was drained with two Penrose drains going down either side of the uterus. The wound was then closed with tier sutures and reinforced with silkworm. A mushroom retention catheter was inserted in the urethra. The pulse average was 167, fairly good quality, and irregular. Post-operative diagnosis was rupture of the urinary bladder.

Her convalescence, while somewhat stormy, was progressive, with complete recovery. On March 23 she developed severe herpes of the mouth, but otherwise made an uneventful recovery, leaving the hospital on the twentieth post-operative day. The patient has remained well to date.

Case 3.—Mrs. K., aged thirty-seven, mother of three normal children, and deliveries normal. She complained of pain in the abdomen, rapid enlargement of the abdomen, pregnancy, shortness of breath, and inability to lie down.

The patient thinks she is seven and one-half months pregnant and about two weeks ago she noticed very rapid increase in the size of the abdomen. During that time she had had some pain, but during the last night very severe pain started, especially on the right side. This radiated to the back and her abdomen became so tense and sore that she could not touch it, and she was unable to lie down because of the severe pain and dyspnea.

Upon admission her temperature was 98.6°, pulse 120, w.b.c. 10,000, urine negative, no nausea or vomiting, and her bowels moved normally. There had been no urinary disturbance in her past pregnancies. The abdomen was enormously enlarged, extended from the symphysis to the costal margin with almost board-like rigidity. On touching the abdomen lightly the patient complained of severe pain. Ballottement indicated fluid present, which was encysted and under great tension. No fetal heart tones were heard. The patient states that she thought she felt movements of the baby during the last two weeks, but not as active as before that time.

Irrespective of the pain the patient has had previously, the sudden onset of the pain before admission, and the enlargement of the abdomen suggested a rapidly growing ovarian cyst and, on account of the severe pain, probably a twisted pedicle. Ruptured uterus and acute hydramnios were also considered.

The patient was given a spinal injection of 200 milligrams of novocaine. A right rectus incision was made. When the peritoneum was exposed, there was a definite blue color beneath, which indicated blood present. In cutting through the peritoneum, the peritoneal cavity was filled with blood and clots. The peritoneum was very thick. All the blood was removed. The uterus was enormously enlarged, filling the entire abdominal cavity. Inasmuch as the source of bleeding could not be discovered, as the uterus was firmly fixed within the abdomen, it was decided with the consent of the family to do a cesarean section. The uterus was rapidly opened. Its walls were extremely thick and, when opened, clear hydramniotic fluid spurted forth, having been under great pressure. It is estimated that three gallons escaped. The child was rapidly delivered, but found to be dead, a monstrosity with anencephalus and spina bifida. The placenta was delivered intact and 1 c.c. of pituitrin was given directly into the uterus by hypodermic. I was then able to pull the uterus directly forward out of the abdomen and found a rupture on the right posterior area, below the attachment of the right tube. Some of the blood vessels in this area were the size of a little finger and bleeding was profuse. The walls of the uterus were closed with three layers of suture. There was another very weak spot on the left posterior surface of the uterus and this was sutured with chromic catgut. During these manipulations, the uterus relaxed considerably and 1 c.c. of ergot was given. Some additional large blood clots were found beneath the liver and these were removed and the abdomen closed without drainage.

Post-operative diagnoses: Hemoperitoneum, cesarean section, ruptured uterus, and monstrosity.

The pathological report of the monstrosity was anencephalia, craniorachischisis, meningomyelocele, pulmonary atelectasia, prematurity, absence of spinal cord.

This mother made the most uneventful recovery of the three cases. Her highest post-operative temperature was 102.2° on the fourth day. It rapidly returned to normal and continued within normal range. The patient left the hospital on the fourteenth post-operative day and has remained well without complaint to date.

DISCUSSION

Dr. A. C. Strachauer (Minneapolis): The diagnosis and treatment of the acute abdomen in pregnancy is the same as in the non-pregnant woman. The literature on the subject always emphasizes the importance of gentle manipulation at the time of operation. This is, of course, always important in the non-pregnant as well as in the pregnant patient. The most common acute condition of the abdomen complicating pregnancy is appendicitis. I personally have operated upon seven such cases. I recall two of these cases at the University Hospital, in which the appendix had ruptured, and in both cases the peritoneal infection was general. Dr. Litzenberg will recall them. Both of these recovered, as did the five cases without rupture, and without any miscarriages obtaining. We should have no hesitancy in operating upon any emergency surgical condition complicating pregnancy. Miscarriage is not likely and has not occurred in a single instance in my personal experience, which includes two cases of myomectomy, one of volvulus, and one of nephrectomy for an acute suppurative condition of the kidney. In conclusion, then, the pregnant woman should be treated the same as the non-pregnant, and miscarriage is a very unlikely occurrence.

Dr. A. T. Mann (Minneapolis): I think we all have had quite a number of cases of acute abdomen in pregnant women. It is quite remarkable how well they stand operations and how rarely they miscarry.

Of the many interesting cases there is one in which the uterus formed the anterior wall of a deep abscess. This was an acute appendicitis, and with an abscess outside of the appendix. The anterior wall was the uterus and the posterior wall the sacrum. The patient was six months pregnant. I opened the abdomen and left a drain in between the uterus and the sacrum. She had a normal child later at full term. Here was a case in which there was actual infection onto the wall of the uterus itself and nothing but a drainage tube between the uterus and the upper part of the sacrum.

Dr. J. C. Litzenberg (Minneapolis): These three cases presented by a general surgeon and discussed so far by general surgeons might give you the idea that any man will operate in these cases. But as an obstetric consultant, I have been surprised at the number of men who, because of the pregnancy, hesitate to open the abdomen in such acute conditions. Wherever there is an acute surgical condition or one dangerous to the patient, the pregnancy should be ignored. Usually the pregnancy is not interrupted by the operation. I think we may approach these cases with surgical judgment and without obstetrical fear.

Dr. Arnold Schwyzer (St. Paul): I think these three cases are unusual cases and very pretty ones. The first case where a simple free torsion of the mesentery caused obstruction is a very unusual one, though I have seen one such case. As Dr. Strachauer says, the most frequent cause of acute abdomen in pregnancy is probably appendicitis. I remember two cases of gangrenous appendix in pregnancy. Labor started and they both died. Thus I greatly fear the combination of pregnancy with acute appendicitis.

Dr. Wilcox's second case, rupture of the bladder in an otherwise normal labor case, is most unusual as it seems there had not yet been much labor pain, if I understood him rightly. I wonder if there was some peculiar weakness in the bladder wall. I have seen one case of rupture of the urinary bladder where 6,000 c.c. of urine were taken away from the bladder; but that was in a case of retroflexed pregnant uterus. That woman came to the hospital with peritonitis from perforation of the bladder due to distention ulcers. She died.

Dr. Wilcox's third case, rupture of the uterus, of course occurs, but here was a non-ruptured hydramnios and, if I understood the case correctly, there was apparently no severe labor pain.

I think, outside of acute appendicitis, the thing which is of comparatively most frequent occurrence is an ovarian tumor with twisted pedicle. When the uterus rapidly descends into the pelvis after delivery, the ovarian tumor follows and sometimes becomes rotated. I have seen this condition, and we have diagnosed it beforehand.

Dr. Wilcox (in closing): In Case 2, the history showed that this woman did not remember passing urine during the evening prior to delivery. She stated that about one and one-half hours before delivery her pain became very severe and she felt that "something broke," then the pain was much relieved. The probable and most plausible explanation of the injury to the bladder, in the absence of pathology therein, is that excessive pressure on a distended bladder during labor caused the laceration described.

Dr. F. F. Callahan (Pokegama) reported the following case of Tuberculosis of the Trachea, and showed specimen removed at autopsy.

Mrs. H. B., married, aged thirty-one, was admitted to Pokegama Sanatorium on August 31, 1931. Her occupation had been that of housewife for the past three years, and she had been a linotype operator for seven years previous to her marriage. She worked in an office with a boy who later developed tuberculosis and died. The family history is negative. She had measles and mumps in childhood, typhoid fever at 21 years of age, and tonsillectomy under local two years ago.

The first symptoms of her present illness were cough and loss of weight which began in the fall of 1929. She consulted a physician in the spring of 1930 who thought the cough was due to heart disease. A diagnosis of tuberculosis was made in April, 1930. She spent two months in bed in New Mexico, returning to Minnesota by car and has been in bed ever since. She has been short of breath for nearly a year and has had acute attacks of dyspnea since May, 1931. She developed bilateral cervical adenitis in the spring of 1931.

Physical examination showed evidence of parenchymal infiltration in the right side with a chronic pleurisy and probably a small effusion on the left side. The sputum was positive for tubercle bacilli. The blood examination was negative except for a low hemoglobin, 51 per cent (Sahli). The urine showed pus cells at two examinations. The Wassermann was negative at two examinations.

Her temperature ran from 100° to 102° most of the time; pulse 100 to 112. The patient always had difficulty in raising sputum and felt as if there was something in her trachea that she could not get out. A bronchoscopic examination was performed on September 17, 1931. This showed a shaggy exudate lining the entire trachea and extending into the main bronchi. Some of this exudate was removed and microscopic examination showed tubercle bacilli. The patient felt better for two weeks after the bronchoscopy and then began to have very severe attacks of coughing and dyspnea. She was considered too ill to be bronchoscoped again and on October 11 a tracheotomy was done by Dr. Gardiner. The patient died during the operation.

Permission was obtained for a partial postmortem, which was done after the body had been embalmed. The left pleural cavity was adherent over the base and there were many small adhesions over the remainder of the left lung. There were a few pleural adhesions on the right side. The heart and pericardial sac were negative. The abdominal cavity was negative There was a small ovarian cyst on the left side. The right lung showed many areas of caseo-fibrous tuberculosis. The left lung showed very few parenchymal tubercles. The lung was small and covered with a thick pleura. The entire trachea and large bronchi in the right lung were lined with an organized exudate. The tracheal rings seemed to be greatly weakened and the trachea was easily compressed. The exudate extended about 2 mm. past the bifurcation into the left main bronchus. The remainder of the left bronchial tree was negative. There were two slightly enlarged lymph nodes in the hilum.

The report on the microscopic sections of the trachea was tuberculosis involving the wall of the trachea including the cartilaginous rings.

The meeting adjourned.

R. T. La Vake, M.D., Secretary.

OVALTINE NOT ACCEPTABLE

The Committee on Foods reports that Ovaltine is a chocolate flavored dry malt extract, containing a small quantity of dried milk and egg which is sold with two slogans: "A food beverage" and "A food concentrate." From its examination of the product, the Committee concludes that Ovaltine is essentially a carbohydrate food, and that its value in gaining weight is no more nor less than that of other similar carbohydrate mixtures, and that Ovaltine is sold with grossly exaggerated claims; its composition is kept a mystery, and that even if it did contain what the manufacturer says it does, it could not do the things the manufacturer says it will. The Committee has listed Ovaltine with the products not acceptable. (Jour. A. M. A., December 12, 1931. p. 1798.)

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of December 3, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held in the lounge on the 20th floor of the Medical Arts Building, on Thursday evening, December 3, 1931, at 8 o'clock.

The meeting was called to order by the Vice-President, Dr. E. K. Green, in the absence of the President. There were twenty-five members and five visitors present.

The following scientific program was presented.

Dr. Verne S. Cabot reported "Two Unusual Cases of Carcinoma of the Colon." The patients were presented.

The two cases to be briefly described and shown here are of interest because of their age variance, the preoperative signs and symptoms, the favorable location of their tumor growths, as well as the choice of surgery employed.

Case 1.—The first case is a man forty years of age, an office worker, whose history shows nothing of importance until November, 1928, when he first began to notice abdominal distress, which was mild, cramp-like in character with maximum intensity in the right lower quadrant. These attacks were mild and infrequent in occurrence until April, 1929, when he had four distinct attacks, still mild in type, and unattended with gastroenteric disturbances sufficient to force him to call medical aid. The following month the attacks of abdominal distress became more persistent, associated with mild colic, most accentuated in the right lower quadrant and radiating to the epigastrium. The taking of food would often initiate the colic, at which time he would be somewhat nauseated, but there was no vomiting. He also noticed a tendency towards bowel looseness, even to watery stools, frequent in occurrence but small in amount. There was no history of melena.

He was first seen at this time, and while being subjected to gastro-intestinal examinations was seized by another similar attack, which sent him to the hospital with a tentative pre-operative diagnosis of acute appendicitis. There was no distention or evidence of reverse peristalsis. There was a slight leukocytosis. Beyond this, the blood and urine showed normal readings.

At operation, through a right paramedian incision an exploration of the abdomen revealed an annular mass at the junction of the middle and distal third of the transverse colon, to the left of the mid-colic vessels. The bowel at this point was not fixed, there were small glandular masses immediately adjacent to the tumor but none was visualized or palpated in the liver; only contiguous portions of the omentum were adherent. There was no distention of the proximal bowel. Approximately six inches of the transverse colon with the immediate gland-bearing portion of the mesentery and adjacent omentum were resected, followed by an end-to-end anastomosis, the suture line being brought up to the wound margin and covered by the remaining portion of the omentum, through which a Penrose drain was carried to the line of union.

His postoperative convalescence was quiet, the Penrose drain being removed on the fifth day. The sixth day there was a definite fecal discharge from the drainage tract left by the Penrose drain, which had been shortened daily and was out on the fifth day. The fistulous tract healed rapidly, being closed by the fifteenth postoperative day, and a week later he was discharged from the hospital. The removed segment of bowel showed an early annular carcinoma without marked ulceration or obstruction. He has worked continuously to date. Gastrointestinal studies as late as October, 1931, showed no narrowing or other abnormalities.

Case 2.—The second case is a woman past her 77th year, who, in December, 1928, first noticed increasing constipation which at that time was attributed to dietary factors and lack of exercise, partly due to advanced age and an arterial hypertension which averaged 200/100.

Her costiveness had gradually increased though enemata gave relief until May, 1929, when she was hospitalized for her increasing obstipation. For two weeks prior to her entry to the hospital she had complained of spasmodic cramp-like pain located at and below the umbilicus, intensified after meals and relieved by colon flushings. Gastrointestinal examinations revealed a partial obstruction in the lower portion of the descending colon and a tentative diagnosis was made of carcinoma with partial obstruction. There had been no history of melena or hematemesis. There were no demonstrable metastases.

This elderly lady was wholly in possession of her mental faculties and when advised of the findings at first refused to consider a colostomy. However, through a left paramedian incision an exploration of the abdomen revealed a small carcinomatous growth annuluar in type involving the lower descending colon at its juncture to the upper sigmoid. There were no visible or palpable metastases. There was no abnormal fixation of the mass. Glands immediately adjacent to the bowel at the tumor site were enlarged. There was no marked distention of the proximal colon.

In view of her age, general condition and the operative findings, a one-stage procedure was adopted, in which the carcinomatous area with adjacent glands with a portion of mesocolon was resected. An end-to-end anastomosis was done, the union being brought up to the wound margin and partially walled off by omentum. A single Penrose drain was placed at the line of suture. Her post-operative convalescence was entirely uneventful. There was no subsequent vomiting or rectal bleeding. The drain was out by the fifth postoperative day. The healing of the wound was by first intention. She was discharged from the hospital on the 18th day following her operation. The resected portion of colon showed a small circular carcinoma with only moderate narrowing. There was but little evidence of ulceration. To date there has been no further complaint referable to the gastrointestinal tract. Subsequent X-ray studies, the last of which was in October, 1931, show only a slight narrowing at the site of resection.

These cases are interesting because of the early date of their recognition and resection, especially so since most often severe and prolonged obstruction with its concomitant sequelæ precedes surgical intervention. The indications for a one-stage procedure, with or without proximal decompression, seldom present; however, in those cases seen early where the tumor is favorably located and in which obstruction is not the predominant factor, it may be of value in selected cases.

DSCUSSION

Dr. F. A. Olson said he would like to ask Dr. Cabot how he did this end-to-end anastomosis?

Dr. Cabot replied that one was done with cautery and the other with the knife.

Dr. E. A. Regnier asked which one had the fistula.

Dr. Cabot replied that the one done with cautery had the fistula. One would think it would be just the other way, but not in this case.

Dr. Regnier thought that the great part of Dr. Cabot's cases was the fact that he was able to do one-stage resections without complications. He stated that there were arguments for and against one-stage procedures: (a) frequently the size of the tumor; (b) amount of inflammation about it; (c) the degree of infection and varying degrees of obstruction make a two-stage procedure more favorable. He asked Dr. Cabot whether in his opinion this type of resection gave his patients as good a prognosis as is possible by a two-tage procedure.

Dr. Cabot replied that this is a debatable question. The one-stage of course has to be in the non-obstructive type. There are less lymphatics in these two areas. Neither of these patients was infected, they were practically non-obstructive and there was no fixation. As far as elevating the mortality risk, he was of the opinion that the one-stage procedure did not do so in either of these cases. The woman was well along in years and had a high blood pressure, and to submit her to two operative procedures he felt would be more of a risk than one operation. Both of these patients lent themselves very well to the one-stage operation. Possibly in the case of the man the risk might have been increased a little by doing the one-stage operation. Dr. Cabot felt that all in all it was preferable in these two cases. Certainly the hospitalization time was shorter, but of course he realized that is not the primary consideration. He mentioned that according to the literature they are doing the one-stage operation in England more and more. And in suitable cases he felt it was a good thing.

Dr. Regnier asked how wide a resection was done.

Dr. Cabot replied about six inches.

Dr. Regnier asked if the same amount of mesentery was used.

Dr. Cabot stated that it was cut down to a V. In the grandmother there was a question of malignancy in a gland of the adjacent mesocolon, but in the man there was none.

Dr. E. A. Regnier reported a case of "Carcinoma of a Tranverse Colon with Secondary Perforation into the Ileum."

The patient, white, female, aged twenty-four, was admitted to the Minneapolis General Hospital on June 26, 1931.

She complained of bloody diarrhea of two weeks' duration; abdominal cramps and nausea of two weeks' duration; and gradual enlargement of an abdominal mass of four months' duration.

Four months previous to the present admission to the hospital, the patient had been delivered of a normal female child at Minneapolis General Hospital. There were no obstetrical complications. Shortly after returning home following the delivery the patient had noticed a small mass to the right of the umbilicus. This mass had grown slightly during the past four months, was freely movable and not tender. Two weeks previous to admission she noticed the beginning of a severe diarrhea. Bowel movements were accompanied by severe abdominal cramps. There was nausea but no vomiting. Four days previous to admission she noticed dark red blood in the stools, and she became very weak. She states that she felt feverish. She had lost about twenty pounds in weight.

The past history and family history were entirely negative. She was married at nineteen years of age. Her husband is living and well. She had had three pregnancies, all normal.

The patient was a well-developed but poorly-nourished, young white woman, and appeared very languid and very pale. The physical examination was entirely negative except for the abdominal findings and the pallor of the mucous membranes. Her blood pressure was 110/80. There was a slight tenderness throughout the abdomen. There was a mass the size of a man's first, firm, freely movable, moderately tender, just to the right of and slightly below the umbilicus.

The Wassermann test was negative. The urine was negative. Her hemoglobin was 42 per cent, r.b.c. 3,000,000, w.b.c. 7,000, p.m.n. 57 per cent, lymphos. 43 per cent. Temperature 100°. The stools were negative for amebæ and parasites, but showed 4 plus blood. The barium studies showed obstruction in the mid-transverse colon with two enterocolic fistulas at the site of obstruction. (A series of X-ray plates were shown.)

The diagnosis was probable malignancy of the transverse colon with perforations into the ileum.

The patient was given a blood transfusion, subcutaneous fluids and high carbohydrate diet of low residue, and on the 14th day of July, 1931, subjected to operation under ether anesthesia. Carcinoma of the transverse colon with two perforations into two separate loops of the ileum was found. The entire mass was adherent to the stomach wall. There were mesenteric nodes which were enlarged. A double loop of ileum was resected about 18 inches in length and end-to-end anastomosis was done to reconstruct the ileum. The mass was freed from the stomach by resecting about three inches of the outer coats of the stomach in the distal portion of the greater curvature. The entire mass was then brought out of the abdomen as in the classical Mikulicz procedure. The patient was transfused following the operation. Forty-eight hours later the tumor mass was resected by cautery, removing about nine inches of transverse colon. A Mikulicz clamp was then inserted in two loops of colon to reestablish the continuity of the bowel. The patient was discharged from the hospital on the 8th day of August.

At the time of this writing the patient is entirely well, has gained 25 pounds in weight, and the wound is entirely healed. Her hemoglobin is 75 per cent.

The pathological report on the tumor was adenocarcinoma of the transverse colon.

Dr. Regnier stated that his purpose in bringing this case to the attention of the Society was to stress the advisability of doing radical surgery in these apparently hopeless cases when there is at least an even chance of prolonging life in comfort. Obviously this seemed like a very radical procedure in the face of great odds, but it was also obvious that this patient could not have lived a month longer without surgical interference. He believed that a two-stage operation was the method of choice in this case. He felt that the ultimate prognosis was not good but the patient has been so well since the operation that he thought the procedure was entirely justified. He believed a great many cases of carcinoma which seem inoperable at the outset can be greatly benefited and in some cases cured by this method of treatment, especially when it is the only means at hand of offering a patient any relief whatever.

DISCUSSION

Dr. F. A. Olson asked Dr. Regnier and Dr. Cabot if they had used the inoculations as recommended by Dr. Bargen.

Dr. Regnier replied he had not used any inoculations. There had been a great deal of difficulty in isolating organisms and there was no conclusive proof that these inoculations were specific. He stated that his own case had been thoroughly vaccinated during the previous three months through the two perforations between the colon and the ileum.

Dr. H. O. McPheeters briefly discussed the injection treatment of varicose veins with special reference to some special work he had done along that line. He stated this particular work was undertaken with three points in mind: (1) to prove the moot question of the reverse flow of blood in varicose veins; (2) that the best results obtained in the treatment of varicose veins are obtained by utilizing the value of this reverse flow; and (3) that many recurrences following the injection treatment are not real recurrences but only incompletely treated cases.

He based this work on the assumption that the direction of flow of blood in the varicose veins could be accurately determined by the blood pressure readings taken at different points along the vein. With that idea in mind, coincident readings were taken with manometers attached to 12-gauge veterinary needles inserted into varicosed loops along the vein. One needle was inserted in the calf, one internal to the knee, one in the mid-thigh, and one into the deep femoral vein just under Poupart's ligament. The readings were then taken with the patient lying prone and erect. The change of posture was brought about by having the patient on a tilting X-ray table.

The results of the blood pressure readings clearly showed that the direction of flow in a fully-developed case of varicose veins was from the sapheno-femoral opening downward to the calf. This work will be reported in full in an early issue of Surgery, Gynecology and Obstetrics.

Dr. McPheeters then showed several slides of varicose veins that had been injected with skiodan. These showed the ramifications of the veins and the connection with the deep system. It also visually confirmed the reverse flow as proven by the blood pressure work. The skiodan slides further proved that the injected solution could be localized almost perfectly by means of the tourniquets and the posture of the injected limb.

DISCUSSION

Dr. Regnier asked if he understood Dr. McPheeters to say that one needle was put directly into the deep femoral vein.

Dr. McPheeters replied that he was exactly right. He said that for about one inch below Poupart's ligament the femoral vein lies internal to the femoral artery and that in this area the needle could be accurately introduced directly into the femoral vein. He also stated that the blood pressure readings had been taken in eight cases thus far.

Dr. Daniel A. MacDonald read his inaugural thesis entitled "Double Uterus and Vagina with Unilateral Atresia." (Paper to be published in full in Minnesota Medicine.)

ABSTRACT

The paper gives a brief résumé of the surgical problem of congenital malformations of the uterus and vagina. Under embryology, the union of the two Müllerian ducts, the formation of the wall of the uterovaginal canal and the development of the musculature of the uterus are reviewed.

The classification of double uterus includes uterus bicornis bicollis, uterus bicornis unicollis, uterus septus, uterus subseptus, and uterus didelphys.

The obstetric complications of double uterus considered are: dystocia, rupture of the mesial wall of the uterus, and postpartum hemorrhage.

Due to the wide variation of conditions met with, each case is a law unto itself and no set rules can be formulated as to treatment. Mention is made of utriculoplasty, unilateral hysterectomy, simple sterilization, and bilateral hysterectomy, as indicated in certain cases.

Dr. MacDonald reported a case of uterus didelphys and double vagina with unilateral hematocolpos and hematometra.

DISCUSSION

Dr. Jalmar Simons of Minneapolis had been invited to open the discussion of Dr. MacDonald's thesis.

Dr. Simons said he appreciated very much the invitation to discuss Dr. MacDonald's paper, which was very interestingly and ably presented. The slides he has shown give an idea of the great number of defects that can result from improper fusion of the Müllerian ducts and the wonder is that here, and elsewhere in the human body where fusion is a vital embryological phenomenon, so few defects occur. Thirty-seven types of genital deformities have been described; the uterine deformities, in order of their frequency, are: (1) uterus bicornis, (2) bicornis unicollis (single cervix), (3) uterus didelphys; the vagina showing frequently partial or complete septums, unilateral or complete atresias. The incidence, according to the most reliable statistics, is one defect in 1,500 gynecologic cases. The records at the Minneapolis General Hospital show one in approximately 1,200 cases as follows: uterus didelphys discovered during an operation for appendicitis; bicornate uterus during an operation for ovarian cyst; complete absence of uterus in a tuberculous patient, there being only a plaque of tissue where the uterus ought to be; two cases of pregnancy in a rudimentary horn, both diagnosed as ectopic.

Vaginal and cervical malformations are diagnosed with ease, but uterine deformities, in the absence of vaginal and cervical malformations as a lead, are often misdiagnosed as uterine tumor and pelvic cysts, and the rudimentary horn pregnancy as ectopic. As shown by one of Dr. MacDonald's slides, the latter may be quite advanced principally because syncytial erosion sufficient to produce significant symptoms of intraperitoneal hemorrhage does not occur until the pregnancy is farther advanced than in ectopic. The mass itself is apt to be considerably larger than an ectopic, and one should be suspicious if vaginal or cervical deformities are present and if contractions occur in the mass.

Deformed uteri are prone to adnexal inflammation and to cause hematocolpos, hematometria and hematosalpinx if there is vaginal atresia, as in Dr. MacDonald's case.

Pregnancy occurs in the presence of genital malformations, according to some reports, about once in 1,500 consecutive cases. There is no depreciation in fertility; abortion is much more frequent; malpositions are more common; accidents of labor are likely, such as abruptio placentæ, retained placenta, rupture of the uterus, and postpartum hemorrhage. Operative deliveries are five times more frequent; morbidity eight times and mortality for the mother four times as great, with a fetal mortality five times the nomal. Here, then, pregnancy is a foreboding condition.

Dr. MacDonald's case of uterus didelphys with double vagina and unilateral atresia was sure to develop symptoms as soon as she began to menstruate and increasingly ominous symptoms which each menstruation. Her symptoms were typical but the physical signs were not adequate for a definite diagnosis before operation.

Dr. Simons felt that the treatment of Dr. MacDonald's case was admirable and he thought the doctor showed considerable ingenuity in treating the blind vaginal pouch as he had. Having excised the uterus with as much of the atresic vagina as possible, he packed the remainder with gauze with the idea that this would produce an adhesive inflammation and, when pulled out through an incision below, the pouch would soon obliterate itself, leaving, as he stated, a small depression to the left of the normal vagina. The opposite uterus was smaller and attached to the right pelvic wall by a very short broad ligament. Pregnancy in this uterus would become a serious affair, so he chose to remove it. Tubal ligation might have been done, leaving the menstrual function for psychic effect. Her amenorrhea, if properly explained, would most likely be accepted with the feeling of a burden eliminated.

Dr. Willard Peterson said he would like to ask a hypothetical question. If a girl should come to her doctor for an abdominal condition such as appendicitis and at operation one of these uterine abnormalities was found, what would the surgeon be justified in doing?

Dr. Otto Yoerg stated that this was a very interesting paper. It reminded him of a case he had seen in his internship days, of a woman who came in to be delivered. The physician was not aware of the fact that the woman had a double uterus. One vagina was about normal in size and the other admitted a finger. Delivery and convalescence were normal.

Dr. Regnier asked about removing the blood cyst from above without opening from below.

Dr. MacDonald stated that the idea of opening below was for drainage and to remove the gauze.

He also added that the literature for the most part deals with the obstetric complications. He recalled one case reported where a diagnosis of ectopic was made and upon opening the abdomen it was found to be a pregnancy in the right horn of a bicornate uterus. The appendix was removed and the abdomen closed. The patient aborted nine days later. She later became pregnant and was brought in at term bleeding. X-ray showed the fetal head in one horn and buttocks in the other. A low flap cesarean section was done. The patient had a stormy course and one week postoperative had a very severe postpartum hemorrhage. Transfusion saved her life but the gynecologist felt that after such a harrowing experience and reading the reports of others, he questioned if one was justified in leaving in the pelvis such a malformed uterus to endanger the woman's life with a future pregnancy. Still another man, who advocates conservatism, had removed the right tube and horn of a bicornate uterus. The patient became pregnant and was brought in near term in a moribund condition. A postmortem was not obtained. Under the circumstances the doctor regretted that he had not removed the left tube also at the time of operation.

In cases of uterus didelphys the right uterus is usually the lesser developed, as is also the right horn of a bicornate uterus.

As far as the frequency of malformations of the genital tract is concerned, Dr. MacDonald stated that, excluding minor defects, Von Winkel in 600 autopsies on females found 2 per cent to have malformations of the sexual organs. Norman F. Miller of Ann Arbor (Amer. Jour. Obs. & Gyn., 1922) collected 54 cases of true uterus didelphys from the literature in addition to one case from the University of Michigan. In the 54 cases there were 34 married women, 31 of whom became pregnant (91.1 per cent). One of the single women became pregnant also and in all there were 67 pregnancies for the 32 women. Normal birth at term occurred in 28 of the 67 pregnancies (41.7 per cent) though a great many of these labors were undoubtedly prolonged and tedious; 19 of the 67 aborted in the early months (28.3 per cent). He also cites Bayard as reporting 14 abortions in 14 cases (100 per cent).

While abortions in general occur in 24 per cent of pregnancies, Miller calls attention to the fact that 32 per cent of abortions are self-induced, and in not one of the cases in the 32 women with uterus didelphys was there a history of self-induced abortion. Forty per cent had complicated labors at term. The most frequent complication in the abnormal deliveries at term was due to the enlarged non-gravid uterus obstructing (23 per cent). Dr. MacDonald stated that the non-gravid uterus enlarges with the gravid uterus during pregnancy to about the size of a small grapefruit.

In the 67 pregnancies reported by Miller, manual removal of the placenta was necessary in 8 (11.9 per cent). In the 54 cases, 42 were associated with double vagina.

Dr. S. H. Baxter asked about sterilizing the patient and leaving the rest of the surgical procedures.

Dr. MacDonald replied that he would consider simple sterilization the ideal treatment in a great many cases. In his own case, however, the round ligament was so short that the right uterus would be lying next to the pelvic wall with a danger of torsion. He also felt that the right vagina should be supported medially in the pelvis. This girl had a pelvis 1 to 2 cm. wider than the adult female pelvis. This, with short round ligaments, was a probable factor as far as the cause of the malformation.

If one is going to treat these cases conservatively, and feels that hematosalpinx does not exist, an incision (wide) in the intervaginal septum can be made. Do not irrigate or introduce any drainage material. Do not make a bimanual examination. Place the patient in Fowler's position and watch carefully for the first symptoms of peritoneal infection. If they occur, immediate laparotomy will probably reveal a ruptured tube. The retention cases reported by Miller were diagnosed on an average of two and one-half years after the beginning of menstruation. The danger of dilatation of the upper genital tract must be remembered.

Dr. Simons said that the incidence of flat pelvis in these cases further complicates the pregnant state. He reported a case of a girl 13 years of age who came to the hospital with very acute pain in the lower abdomen and a history of two similar attacks of less severity. There was no vagina but she had a hematometra of the size of a 3-months' pregnancy. At the introitus a line of cleavage was found which dissected up to this mass; the mass was then punctured, liberating first tarry, then brown, then red blood. A tube was sewed in for drainage and to establish a permanent canal. Two years later, examination showed a somewhat atresic vagina, and a history of normal menstruations was obtained.

Dr. MacDonald said that in 32 cases of retention reported by Wells (Amer. J. Obst., 1900) there were 11 deaths. Of these 11 deaths, 9 occurred from septic peritonitis after puncture of the sac from below. He added that though the mortality undoubtedly is much lower today with the same procedure, there are recorded deaths even where laparotomy has been performed with the first symptoms of peritoneal infection.

There was no special business to come before the Society at this meeting, and upon motion the meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

OYSTERS—A PLEASANT TYPE OF THERAPY

The announcement three years ago that copper is effective in supplementing iron in the cure of anemia produced by an exclusive milk diet in the rat promptly aroused interest. The inferences drawn by others than the investigators themselves has led to confusion and mistaken advice. There has been no warrant whatever in applying the observations without reservation to some of the unusual conditions of the blood, such as pernicious anemia in man. At the moment there is some debate whether copper stands alone in the capacity to promote the function of the iron in hemoglobin and blood cell formation. Other elements, such as manganese and germanium, are clamoring for equal recognition. Meanwhile all sorts of new products containing both iron and copper are foisted not only on the ignorant public but also on an uncertain medical profession. The chief objection to such unproved therapy is the sense of false security which leads to the neglect of other modes of therapy that may be far more effective. Recent investigations have shown oysters to be capable of curing the nutritional anemia of milk-fed rats. The studies indicate that the inorganic elements present in the oyster are responsible for its hemoglobin regenerating capacity and that the antianemic potency of the oyster can be accounted for on the basis of its content of the three elements iron, copper and manganese. (Jour. A. M. A., December 26, 1931, p. 1970.)

Berkeley George Andrew Moynihan, Baron Moynihan of Leeds, president of the Royal College of Surgeons, had a look at Sculptor Jacob Epstein's Genesis, grotesque figure of primitive pregnancy. Wrote he to his newspaper: "I regret to say that, in my opinion, Epstein is almost certainly guilty of an error in diagnosis. The lady, I think, is not pregnant. . . . The abdominal tumor in position and in salience is not that of pregnancy. . . . The mammary condition is that of an adipose virgin and not of a primiparous woman whose delivery is drawing near. . . . On the available evidence . . . I believe that the hopes of her admirers will be disappointed, and that no new birth is about to reward her for her obvious suffering. I can almost fancy that her expression indicates that she herself is beginning to realize this."—*Time,* Dec. 14, 1931.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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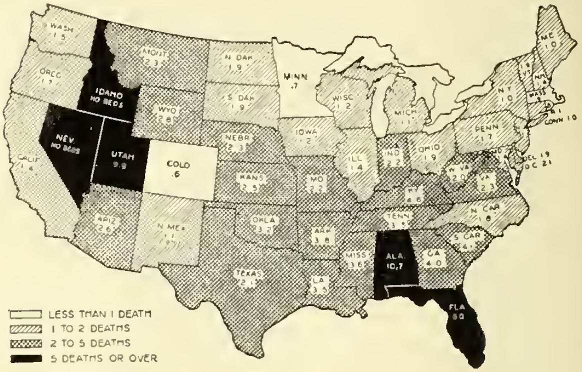
MEDICINE

TUBERCULOSIS ABSTRACTS*

It is estimated that there are in the United States about 828,000 cases of active pulmonary tuberculosis. The total number of hospital and sanatorium beds now occupied by tuberculosis patients is about 80,000, leaving a remainder of 748,000 patients who are either receiving treatment at home or none at all. Perhaps most of those who take the cure at home do so because they are not persuaded of the advantages of the sanatorium. Others cannot enter institutions even though they would, because of inadequate local provisions. A considerable number pursue the cure at home on the advice or at least with the tacit consent of the physician. Paul H. Ringer at the eighty-second annual session of the American Medical Association discussed the question of home treatment versus institutional treatment of pulmonary tuberculosis. Abstracts of his paper follow.



Number of beds for tuberculosis cases compared with number of deaths from tuberculosis—1928. (Exclusive of federal and penal institutions and hospitals for the insane.)

HOME TREATMENT VERSUS INSTITUTIONAL TREATMENT

The uniform success achieved by sanatoria in all parts of the country has led to the belief that climate counts for nothing and that, therefore, the cure may be carried out just as well at home. But this attitude overlooks the prime object of the institution; namely, the education of the patient. Moreover, in the sanatorium, rest is found for the mind as well as the body, for there are no responsibilities and a patient is surrounded by a sympathetic environment.

In only a minority of cases will home treatment work. Taking the cure is like finding "a way of life" and that way is particularly hard for the patient to follow at home. If there is nothing more to the treatment than bed rest, reasons the patient, he might better be at home. If he has a good home, that might be true but the point he overlooks is that, in addition to bed rest, there are details one learns from physicians, nurses, and other patients, the force of example, and the common routine. A period of quiet and of relative isolation helps the patient to regain his composure, after having been upset by the news that he has tuberculosis. He makes his adjustment to the necessary and tedious inactivity in the company of others who are trekking along the same trail.

In an institution, the regimen is so planned as to make it easy to do the right thing. The patient must deliberately step out of line in order to do the wrong thing. At home, the patient is forced to swim against the tide, for relatives and friends have scant realization of the limitations that must be placed on the patient.

The patient at home may obtain bodily rest, but relaxation, that is, freedom from mental strain, is difficult to secure. He is subject to disturbance by (1) the family, (2) friends, and (3) business. Family irrita-

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*Reprinted from *Tuberculosis Abstracts*, a review for physicians issued monthly by The National Tuberculosis Association, Volume IV, Number 12, December, 1931.

tion, not rare in health, is aggravated in time of sickness. Overanxiety of relatives, a deleterious influence even in an illness of short duration, becomes a factor of major seriousness when exerted over a period of many months. The normal chatter and noise of young children render the patient's nervous system taut. At the same time, the desire for expressed affection leads to many contacts and repeated exposure of the child to tubercle bacilli. All of the minor ailments and petty misunderstandings of the household impinge themselves on the consciousness of the patient, even in an affluent home, and more so in one of poor circumstances.

The control of visiting friends is almost impossible. Strict visiting hours cannot be maintained. If there is a nurse, she is likely to be off duty during several hours in the afternoon, which is the time when friends commonly call. The disturbing gossip retailed by visitors who stay on and on leaves the patient fretful or worn out. Unsolicited advice about food and rest and "harmless" diversions, such as going to the movies or taking an auto ride, undermine the patient's morale.

Business associates are a disturbing element. Matters come up which by discussion in person or over the phone "take only a minute" to settle but leave hours of disquiet and worry. Business friends drop in when it is convenient to them and talk shop, which leaves the sick man unsettled in his mind and rebellious at the fact that he cannot take an active part. These difficulties, in principle, apply with equal force to women patients.

Most patients do best at an institution some distance away from home, say 200 miles. Visits of relatives are more difficult and telephone conversations less frequent. A factor to be considered is the enthusiasm, anticipation, or hope engendered by going away to a favorable environment; this the patient cannot possibly have if he simply goes to bed amid familiar surroundings.

THE DOCTOR SHOWS THE WAY

The determination to get well is essential. We physicians can only point out to the patient "the way of life"; mark the highway, warn against side roads, steer clear of impassable byways. We cannot carry the patient one yard, save in those cases in which lung surgery can be employed.

The author does not advocate sending the patient away from home immediately subsequent to a diagnosis of tuberculosis. Patients with tuberculous bronchopneumonia and patients who have had hemoptysis with subsequent areas of softening, accompanied by high fever and evidences of acute illness, are much better kept at home until the initial acuteness of the condition has subsided and they can be moved with relative safety. Nor should patients be "railroaded" out of their homes without being given time to take in the situation or to adjust themselves to what appears to be a cataclysmic upheaval in their lives.

The author feels that the great benefits to be obtained from leaving home and preferably from institutional treatment are as much psychic as physical; but in the case of tuberculosis, the psychic and the physical are so intimately blended that it is next to impossible to evaluate one above the other.

DISCUSSION

Dr. James Alexander Miller: The proper regulation of rest and exercise by which each patient gradually learns his individual limitations is the most essential element in the system of cure. As with many other forms of education, this knowledge comes only by long, persistent effort. Schools are more effective than home study or correspondence courses. A sanatorium is a school for health. The patient learns unconsciously from the example and experience of his associates. He need not learn entirely from his own mistakes, which are often costly. Gradually, the knowledge of his limitations leads him to a habit of life which is instinctive and consequently no longer irksome. The skilled guidance of a trained physician, experienced in the care of chronic diseases, thoughtful of varying temperaments, capable of giving inspirational guidance, always patient and persistent, helps the patient to acquire not only a habit but a philosophy of life which enriches his life.

Dr. A. M. Forster: I was interested in what Dr. Ringer said about the difficulties of home treatment as compared in men and in women. I use an illustration in talking to the woman who wants to go back to her children. I tell her that if we took her husband and put him in his office on a cot and told him that all he needed was rest, and that he need pay no attention to the bookkeeper or to the customers or to his partners or to the telephone, and would simply get himself into the proper psychologic state and would rest, then that situation would be comparable to what the woman has to submit to when she attempts to take a rest cure in her own home.

Dr. James M. Anders: Treatment in a sanatorium some distance from home is more nearly ideal, although to remove the patient a long distance has certain disadvantages. The force of example as an aid to the patient has been under-estimated. In general, a stay of from nine months to a year is required to teach the patient the institutional regimen. When he has mastered that and if he possesses average intelligence, the treatment may continue at home.—*Pulmonary Tuberculosis—Home Treatment versus Institutional Treatment, Paul H. Ringer, Jour. of the A. M. A., August 8, 1931.*

A STUDY OF THE FIVE-HOUR DEXTROSE TOLERANCE CURVE IN TREATED DIABETIC PATIENTS: Elaine P. Ralli, M.D., and James Shannon, M.D. (Amer. Jour. of Med. Sci., September, 1931). This is a study of the effects of the glucose tolerance test on a number of treated cases. The cases were first classified clinically as mild, moderately severe, and severe, and then the results from the glucose tolerance test were compared with the classifications previously made. In general, they coincided.

There has been some obscurity in interpreting the normal glucose tolerance test. In normal cases the greatest elevation of the hyperglycemia is from one-half to one hour after the ingestion of glucose. The blood sugar returned to normal in from two to three hours. In the mild cases the greatest elevation of hyperglycemia occurred from one to two hours after meals, and dropped back to normal in from three to four hours. In the moderately severe the hyperglycemia was variable, and the return to normal was at the end of a four or five-hour period. In the severe cases there was marked hyperglycemia during the whole five hours.

This short paper is of value in a practical way because it shows that a five-hour glucose tolerance test gives more information than the usual three-hour test.

The important conclusions derived from this study are as follows:

1. There is evidence that in a starving blood sugar of over 0.16 mg. the patient will not return to the normal blood sugar in five hours; in other words, it indicates a severe diabetes.

2. The blood sugar taken four hours after meals is a far better index of severity than the starving blood sugar. In general, a five-hour determination will give more information than the usual three-hour test. The duration of hyperglycemia, rather than the elevation. is of more clinical value.

Richard Bardon, M.D.

CARBOHYDRATE METABOLISM IN RELATION TO POSTOPERATIVE CRISES IN HYPERTHYROIDISM: Charles H. Frazier, M.D., Sc.D. (Amer. Jour. of Med. Sci., Sept., 1931). The conclusions from this article are also of considerable practical value.

In exophthalmic goiter there is a decrease in the islands of Langerhans. This was reported in 1921 by Holst. Hyperthyroidism exhausts the glycogen store in the liver, and according to the author the liver seems to be the only source of blood sugar.

The rational treatment of crises following hyperthyroidism has to do with the use of intravenous glucose. A crisis may demand sugar over and above the available supply, and may precipitate a fatal hypoglycemia.

For some years glucose has been used in the postoperative treatment, but not very intelligently. Frequently it is given by rectum—a method now known to be totally ineffectual. It can be given by mouth, except that one cannot control the rate of absorption. When given intravenously, numerous precautions are necessary. It has been found out by Wilder, in 1917, that the normal individual can take care of .800 gm. of glucose per kilogram of body weight per hour when given intravenously, but the patient with hyperthyroidism develops glycosuria when as much as 0.6 gm. of glucose per kilogram of body weight per hour is injected. This would indicate faulty glucose assimilation.

The author recommends the administration of glucose solution but believes that it should not be given too rapidly or in too high a concentration. Usually a 5 to 10 per cent solution is the most satisfactory concentration, and the slow intravenous, continuous drop, has many advantages over the other methods, as it permits the addition of fluid at a rate at which the tissues, which normally take a part in the storage of water, can accommodate it. Just what causes these postoperative crises is, as yet, a matter of speculation. The author believes that glucose helps to tide the patient over a very critical period, and suggests that possibly the entire process is one of a disturbed carbohydrate metabolism, where the problem may be even more complicated.

There is considerable evidence from this paper that possibly the crises following thyroidectomy may be associated with hypoglycemia, although the whole mechanism is extremely obscure at this time.

Richard Bardon, M.D.

PEDIATRICS

THE EFFECTS OF SUSTAINED PITUITARY ANTIDIURESIS AND FORCED WATER DRINKING IN EPILEPTIC CHILDREN: A DIAGNOSTIC AND ETIOLOGIC STUDY: Irvine McQuarrie and D. B. Peeler (Jour. Clinical Investigation, 10:915, Oct. 20, 1931). The authors refer to work already reported on the relationship of water balance to the occurrence of convulsions in severely epileptic children, in which it was found that seizures, after having been brought under control by the production of a deficit in the body water, could be made to recur practically at will by the rapid reëstablishment of a positive water balance with pituitary antidiuresis. The possibility of utilizing the observed reactions of the severe epileptic to an enforced positive water balance as a diagnostic procedure in mild or obscure cases occurred to the authors early in their studies.

The experimental subjects used in their present study consisted of three groups of children. The first was made up of patients who gave personal histories more or less typical of "idiopathic" epilepsy, but had seizures at infrequent intervals. The second included cases with indefinite histories of "fainting spells" or "sleepy spells," but no history of generalized convulsions or true petit mal. The third group consisted of essentially normal children. The food given included the ordinary mixed diet, and special diets comparatively low in NaCl. Two of the epileptic patients were kept on a basic diet, consisting exclusively of heavy cream, sugar and water, the purpose being to limit the mineral intake to an extremely low level, except for short periods when carefully weighed amounts of NaCl were added for a special purpose. While under observation a complete study was made of the water and mineral balances for each patient.

To produce a positive water balance, water was given at the rate of 2 to 5 c.c. per kilogram of body weight per hour at either three- or four-hour intervals, simultaneously with sufficient amount of antidiuretic extract from the posterior lobe of the hypophysis (either pituitrin or pitressin P.D.) to prevent water diuresis. As a result of these studies the authors report that typical grand mal seizures can be induced within twelve to forty-eight hours in the epileptic, but not in the non-epileptic subject, by giving water at the rate of from 2 to 5 c.c. per kilogram of body weight per hour, while maintaining effective pituitary antidiuresis. This difference in response between epileptic and non-epileptic patients may be helpful in establishing the diagnosis early in an obscure case. Under the conditions of the experiments as described, dilution of the extracellular body fluids appears to be an essential factor in the induction of seizures since the administration of an amount of NaCl just sufficient to prevent this tends to interfere with their occurrence. The results presented lend strong support to the view that the mechanism for controlling semipermeability of the brain cell membrane is inherently defective in the epileptic patient.

C. A. Stewart.

THE POSTURAL TREATMENT FOR CEREBRAL HEMORRHAGE IN THE NEWBORN: Edwin A. Riesenfeld, M.D., New York, N. Y. (Arch. Ped., Vol. XLVII, No. 11, November, 1931). The presence of intracranial hemorrhage has been found as low as 10 per cent and as high as 60 per cent in all autopsies in stillborn infants and infants dying in the first few days of life. Among all the intracranial birth lesions, hemorrhages rank first as causing death.

The premature infant is particularly predisposed to intracranial lesions, due to the insufficient development of its tissues. When hemorrhage is extensive, usually associated with injury to the brain, the child is stillborn. In smaller hemorrhages, the child is stuporous. It cries with a peculiarly high pitched note. Respirations are irregular and feeble. Cyanosis, more or less constant, is observed. The infant nurses poorly or refuses to nurse at all. Convulsions occur frequently. In extensive hemorrhages, there may be bulging of the fontanel and separation of the sutures. A rise of temperature is often observed. The infant is usually pale. It appears as if in shock.

The generally accepted method of treatment has been confined to the administration of whole blood or blood serum, spinal tap, or the removal of blood or blood clot by entering the cranial vault. The last method is rarely resorted to today. Spinal tap, to relieve pressure and remove blood, is staunchly advocated by some, and as vehemently condemned by others. All new-born infants in whom the diagnosis of cerebral hemorrhage has been made should be placed in an upright position. The child should remain in the upright position for eight to ten days, or even longer should the symptoms of cerebral hemorrhage continue to manifest themselves.

Lessening in pressure readings in the cerebrospinal fluid in the upright position would tend to establish the rationale for the postural method of prophylaxis and treatment. In the upright position, the sagittal venous pressure is materially lessened as determined by animal experimentation. This would seem to be the logical position in dealing with bleeding from a torn cranial vein.

R. N. Andrews, M.D.

APPENDICITIS IN INFANCY: Benjamin Lipshutz, M.D., Philadelphia (Arch. Ped., Vol. XLVIII, No. 10, October, 1931). The highest mortality of appendicitis is at the extremes of life, over the age of fifty and under the age of three. Appendicitis in the nursling is rare.

The importance of the early diagnosis of acute appendicitis in infancy is very great, since the infection tends to rapidly diffuse throughout the entire peritoneal cavity. The general effects are usually severe, and toxemia may reduce the patient to a dangerous state within 12 to 24 hours. The defensive reaction of the peritoneum in the young is characterized by an extraordinary rapidity of absorption. The encapsulation and isolation of a peritoneal infection with dense hard organized adhesions is rather a process of adult life. Once the infection has advanced to the stage of an acute diffuse peritonitis, the outlook for recovery becomes very grave. Of all abdominal surgical emergencies, at least 50 per cent result from appendicitis.

Every infant or child that complains of vomiting and exhibits evidence of abdominal pain should be considered as a possible case of appendicitis. The association of vomiting with diarrhea is the unusual in appendicitis. Vomiting and constipation are the cardinal symptoms of peritoneal irritation.

Acute abdominal symptoms may have their origin in some thoracic lesion. In doubtful cases a careful emergency X-ray of the chest will often disclose positive pulmonary findings before they are evident on physical examination. It is a matter of common knowledge that patients with throat infections or upper respiratory tract infections occasionally develop severe abdominal pain.

If, after a careful clinical survey of the patient, the diagnosis remains uncertain, it is a safe clinical bet that the odds of safety are clearly on the side of surgical intervention.

R. N. Andrews, M.D.

SURGERY

PHRENICECTOMY IN PULMONARY TUBERCULOSIS—INDICATIONS FOR THE OPERATION AND POST-OPERATIVE ACCIDENTS: Roger Pigeon (Revue de la tuberculose, 1931, XII, 842). The ideal indication is the fibrosing case in which pneumothorax cannot be used. The fibrosing tendency of such a lesion is shown in various ways: by clinical signs indicating the lack of any tendency to rapid progression, by well known X-ray signs, such as homogeneous shadows due to pleural thinkening, diminution of intercostal spaces, unilateral deviation of the trachea, lack of mobility in the diaphragm when the patient is made to breathe deeply, a scalloped diaphragm indicating adhesions, which prevent a satisfactory pneumothorax, finally the costophrenic angle obscured, retraction of the ribs, bronchiectasis, dextro- or sinistrocardia. Some authors, however, consider complete pleural symphysis a contra-indication.

But not all cases showing a tendency to fibrosis are suitable for phrenicectomy. The typical case in which early and satisfactory results are obtained is the one characterized by a recent ulcero-fibrous lesion. In the presence of a lesion of this type the size of a hazelnut or up to the size of a walnut which has appeared without warning, the physician should not delay too long waiting for the spontaneous retrogression which rarely occurs; when a cavity the size of a mandrin has developed it is often too late. Even smaller cavities, if surrounded by organized fibrous walls, may prove refractory to the treatment. Again, it is necessary that the cavity be surrounded by more or less healthy tissue. It is foolish to expect results from phrenicectomy in extensive consolidated caseous areas such as are encountered in tuberculous pneumonemia, especially in the right upper lobe. Finally, the lesion should ordinarily be unilateral though small cicatrized lesions on the opposite side may be present.

In brief the principal indication for phrenicectomy is the presence of an ulcerofibrous lesion with little tendency to rapid evolution and not secreting profusely. It may be at apex or base, on the right side or the left. It should be relatively recent, well localized, usually unilateral and not amenable to pneumothorax. The immobility secured is roughly proportional to the length of the portion of nerve removed.

Postoperative accidents.—The authors note the occurrence of headache, vomiting and tachycardia as of rather frequent occurrence though of not more than a day's duration, immediately following the operation. Spread of the lesion to the other side occurs in certain cases. In others with extensive though unilateral fibrous lesions, dyspnea has been considerably increased, especially if the elevation of the diaphragm has been considerable.

Hemoptysis has occasionally developed when not previously present. The writers have not observed gastric complications though other writers have reported them. Possibly certain abdominal symptoms may be due to change in intra-abdominal relations following the operation.

Cardiac complications have been reported by various writers but serious ones are rare. Naturally if a marked increase in the height of the diaphragm is secured, more work will be required of the heart and the operation should not be attempted in those whose hearts are already overtaxed. Bilateral phrenicectomy has been used by several physicians in the treatment of basal cavities but the writers do not seem to have had any experience with it and urge caution in its use.

Phrenicectomy may be used in association with pneumothorax, apicolysis or thoracoplasty. In pneumothorax it is indicated when adhesions at the base limit the completeness of the collapse. It is also of value in certain cases of spontaneous pneumothorax. The use of pneumothorax on one side and phrenicectomy on the other side for a basal cavity is mentioned. The writers quote with some approval Wirth and Vonjaski, as recommending phrenicectomy before pneumothorax when a workman's time or resources are limited. They claim that the interval between refills may thus be lengthened. The use of phrenicectomy either before or during apicolysis and thoracoplasty is also approved.

A. T. Laird.

EFFECTS OF POSTURE AND THE DIAPHRAGM AND MEDIASTINUM WITH REFERENCE TO PHRENICECTOMY: Lincoln-Fisher (Amer. Rev. of Tuberc., XXIV, p. 57, July, 1931). In the first portion of the paper the author reviews the use of the recumbent postural positions in the treatment of tuberculosis. He describes the use of apparatus in the study of the effects of position on the diaphragm and mediastinum with the aid of the fluoroscope. He lists the different points from which the measurements are taken.

He states that when the lateral position is first assumed there is shown in the normal an initial increase in the excursion of the diaphragm which is most marked on the dependent side. After a period of thirty minutes to one hour this increased excursion is decreased somewhat, more so on the dependent side. The excursion of the diaphragm is more in the lateral recumbent posture than in the erect position.

Concomitant with the increased excursion is a rise of the diaphragm on the most dependent side. At the end of the hour there is a farther rise in the diaphragm of the dependent half, accompanied by a partial recovery and rise of the upper half. The dependent half of the diaphragm assumes a higher position and the upper half assumes a lower level in the lateral posture than with the patient standing erect. The heart and the mediastinum fall toward the dependent side, shifting as much as 5.3 cm. in one hour. The average shift was greater with the patient on the left side. After phrenicectomy these findings are accentuated. When the paralyzed half of the diaphragm is most dependent there is an increase in the elevation of the paralyzed half, and then the unparalyzed half of the diaphragm when uppermost assumes a lower level and has increased excursion. This persists to some extent while erect. The heart and mediastinum show a tendency to fall more to the paralyzed side. At times postoperatively the patient complains of trouble in breathing when lying on the good side.

The author then shows a number of tables of fluoroscope experiments to show his contentions in regard to the position of the diaphragm in the different positions.

In the summary the author states:

1. The diaphragmatic excursion is generally greater if the patient is in the lateral recumbent posture, decreasing somewhat before the end of an hour.
2. The lateral recumbent posture ascent of the de-

pendent and descent of the upper hemidiaphragm occurs initially, both halves assuming a somewhat higher level by the end of an hour.

3. The heart and mediastinal contents shift towards the dependent side, the average displacement being greater to the left than to the right.

4. Following phrenicectomy there is descent and increased excursion of the contralateral hemidiaphragm, which is accentuated and tends to persist in the lateral posture. The dependent half is forced still higher into the thorax by the pressure of the abdominal viscera.

5. Displacement of the heart and mediastinum due to posture is greater in phrenicectomy.

6. Increased respiratory labor following phrenicectomy requires a compensatory overaction of the contralateral hemidiaphragm forming the paralyzed half. This hyperactivity is less as the postoperative interval lengthens.

7. Posture rest on the better side following phrenicectomy is inadvisable.

8. The lateral recumbent posture increases diaphragmatic breathing, a change favoring rest of upper lobe lesions. Following phrenicectomy the scope of postural rest is widened, especially for patients with unilateral involvement or with only apical disease in the contralateral lung.

Since reading this article I have instituted the postural treatment in some of my cases of phrenicectomy. In those in which I have used this I have had the following complaints:

1. That when first used there is an increase in coughing and in the amount of sputum expectorated.

2. That after a time this subsides and the patients in general feel much better.

No remarkable results have been as yet shown.

J. J. Rouse, M.D.

THE MENACE OF METHYL ALCOHOL

The dangers from the use of methyl alcohol have increased because the prohibition of alcoholic beverages has led to the substitution, in ignorance or unwittingly, of methyl alcohol. The danger has been increased by its use in automobiles as an anti-freezing agent in radiators of motor cars. In addition to the deliberate or the unsuspecting imbibition of the harmful methyl alcohol there are the dangers not only of inhalation of its vapors but also of its possible absorption through the skin. From studies on animals, it has been estimated that approximately 1 ounce of methyl alcohol repeatedly in contact with the human body, under conditions favorable to retention and evaporation, constitutes a threat to well-being. It has also been estimated on the basis of experiments on monkeys, that the vapors of one ounce of methyl alcohol entering the human body constitute a threat to life even when the exposure is distributed over two or three days. (Jour. A. M. A., December 5, 1931, p. 1710.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Electrotherapy and the Elements of Light Therapy. Richard Kovacs, M.D. Clinical Professor and Director of Physical Therapy, Polyclinic Medical School and Hospital, New York, etc. 528 pages. Illus. Price, cloth, $6.50. Philadelphia: Lea & Febiger, 1932.

Proceedings of the Twenty-fifth Annual Convention of the Association of Life Insurance Presidents. 278 pages. Illus. New York: The Assn. of Life Insurance Presidents, 1931.

Annual Report of the Surgeon General of the Public Health Service of the United States. For fiscal year of 1931. 354 pages. Illus. Price, 85c, cloth. Washington: U. S. Government Printing Office.

Courts and Doctors. Lloyd Paul Stryker. General Counsel for the Medical Society of the State of New York. 236 pages. Price, cloth, $2.00. New York: The MacMillan Company, 1932.

General Surgery. The Practical Medicine Series. Edited by Evarts A. Graham, A.B., M.D. 804 pages. Illus. Price, cloth, $3.00. Chicago: The Year Book Publishers, 1932.

General Medicine. Practical Medicine Series, 1931. Edited by George H. Weaver, M.D., et al. 814 pages. Illus. Price, $3.00. Chicago: The Year Book Publishers.

Physicians' Manual of Birth Control. Antoinette F. Konikow, M.D. 245 pages. Illus. New York: Buchholz Publishing Co., 1931.

Primer on Fractures. Coöperative Committee on Fractures, American Medical Association. 63 pages. Illus. Price, $1.00. Chicago: American Medical Association Press, 1931.

FEMALE SEX HORMONOLOGY: A Review. By William P. Graves, A.B., M.D., F.A.C.S., Professor of Gynecology at Harvard Medical School. First Edition. Cloth. Price, $3.50. Pp. 131, with illustrations. Philadelphia: W. B. Saunders Company, 1931.

A contemporary of Virchow or of Pasteur may have looked into the fields opened by those men and seen potentialities equal to those which, "with wild surmise," appear to modern physicians in the subject of female sex hormonology. The prospect is fascinating, rich and stimulating. The facts known are many, and conjecture and theory concerning them has greatly increased the complexity of the situation. Attempts at reviewing the subject are numerous; this effort of Graves' is conspicuous among them by reason of its clearness. He achieves this clearness by his arrangement of material, by freedom from digression, and by a glossary which adequately defines and describes the terms of a rapidly growing, special vocabulary. In this glossary certain original investigations in hormonology are specially designated as historical landmarks, and will thus serve as guides to the reader in this field.

The book, as indicated by the author, was "originally undertaken to furnish a concrete picture of a complex subject" for his lectures. It is designed, as he says, for the student with little previous knowledge of the subject. It is this point which makes the book so valuable, for the student who may have had previous knowledge of the subject will almost certainly be more hopelessly lost than one who had none; the author indicates this—with another connotation, however—when he says that "as the game proceeds the pawns will necessarily be differently placed." An illustration of this idea is seen in the work of Hartman concerning menstruation, in which the previous conception of that process is completely changed from a passive to an active one, with a special pituitary hormone producing it independently of either the follicle-stimulating or the luteinizing principle.

There are twelve chapters: Early history; Sexual cycle in animals; Sex cycles in the ovary; Sex cycle of the human uterus and its correlation with that of the ovary; Search for the hormones of the ovary; Discovery of the hypophysis as an agent in the sexual and reproductive cycles; Hormones of the anterior lobe identified; New theories regarding menstruation; New theories regarding parturition; New theories regarding lactation; Organotherapy.

E. C. HARTLEY, M.D.

SIMPLE LESSONS IN HUMAN ANATOMY. B. C. H. Harvey, M.D., Professor of Anatomy, University of Chicago, American Medical Association, 1931. Price, $2.00.

This moderate sized inexpensive volume is a compilation, somewhat elaborated and with numerous illustrations added, of a series of articles by the author which appeared in *Hygcia.* The material was prepared for the lay reader and is presented in an interesting manner (a supposedly impossible task), the functions of the various parts of the body being correlated. The volume would be suitable for the high school curriculum.

C. B. DRAKE, M.D.

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MINNESOTA MEDICINE

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OPERATIVE TREATMENT OF JOINT TUBERCULOSIS*

MELVIN S. HENDERSON, M.D.
Rochester, Minnesota

TUBERCULOSIS of bones and joints in America is on the wane. This is fortunate, but it does not bring solace to the unfortunate person who is afflicted, and he stands before the medical profession as a challenge to find measures of relief.

Joints are composed of bone, cartilage, ligaments, and the true joint lining (synovia). Usually when tuberculosis involves any given joint both bone and synovia are affected. Involvement of the joint lining only, or of the shaft of the bone only is rare. Tuberculosis of a joint is always preceded by the presence of the disease elsewhere in the body. The usual channel of entry for the bacillus is either the air passages, and so into the nodes at the base of the lung, or the intestinal tract, and thence into the nodes of the abdominal cavity. From these nodes the bacilli enter the blood stream, and are deposited in the skeletal structures and in the joints. In reality, therefore, we are dealing with a systemic disease, and regardless of whether conservative or operative treatment is to be accorded the affected joint, constitutional treatment is of primary importance. Perhaps the greatest danger of operative treatment of tuberculous joints is that all the attention may be focused on the joint, and the general and hygienic measures so essential to treatment may be neglected.

Tuberculosis of bone has been recognized and treated for many years, and it would seem that the results obtained and recorded in large institutions and in organized clinics would be available as definite guide posts, by which treatment could be directed. One can picture the dilemma of succeeding generations of young physicians and surgeons who assume the difficulties of treating such patients. When these surgeons visit such a center as Leysin, Switzerland, where Rollier carries on his treatment, they find him using only conservative measures, and when they visit the clinic conducted by Hibbs at the New York Orthopedic Hospital, they find a diametrically opposite stand, since he advocates operative treatment. After all, the results obtained should control the type of treatment, and out of the haze of conflicting views certain facts are gradually accumulating for the guidance of future generations. A famous man's personality and the glamour surrounding him may cause the over valuation of certain methods advocated by him, but trial by others is the acid test.

The treatment of tuberculosis of the joint may be classified under two headings: conservative and surgical. I shall speak today of the operative treatment, but before I embark on any consideration of the subject I wish to make it clear that my remarks will be confined to tuberculous joints of the adult. I am aware that there is a tendency to advance the line of operative attack to include the diseased joints of children, and although because of frequent disappointment in the conservative treatment for children, I am fundamentally in sympathy with this trend, there are many factors to be considered. The child's time is not so valuable as that of the adult, he has no responsibilities, and often, in healthful and happy surroundings, overcomes the disease. Institutions are readily available for the child, in which he may stay indefinitely, whereas this is not true of the adult. My experience has been chiefly with the adult. My comparative inexperience with the disease in children and lack of records of sufficient end-results with children on which to base my opinion lead me to be unwilling to take any definite stand. At The Mayo Clinic the majority of children are treated by conservative measures.

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*From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minn. Read before the Mississippi Valley Conference, St. Paul, Minnesota, September 21 to 23, 1931.

I firmly believe, that taken by and large, the end-results in the adult, following even carefully controlled and protracted conservative or non-operative treatment of tuberculosis of joints, have been poor. In America people are loath, even if the opportunity is available, to submit to prolonged recumbency, heliotherapy and so forth. They become discouraged, accept their braces as necessary evils, and get along as best they can. For many years we have seen, in The Mayo Clinic, numbers of adults with tuberculosis of the joints who have been wearing braces and appliances for long periods with no appreciable curative results. I do not intend to convey the idea that adult patients never get well under conservative measures, for I believe they occasionally do. If, after years of conservative treatment, a tuberculous joint will become ankylosed, it is looked on as a triumph for conservative measures. If the same can be accomplished in as many months through operative measures, why waste all the time? Operative measures either should eradicate the disease entirely, or as nearly as possible. It should also induce ankylosis, with the minimal risk to the patient of death or dissemination of the tuberculosis. The chances of success will vary with the patient and with different joints. The structure of the joint and its contiguous structures have a bearing on the outcome. It is manifest that although a patient may have a tuberculous knee that should be resected, if he has active tuberculosis of the lungs and bilateral renal tuberculosis, operative measures are not indicated. It is also self evident that the same thorough resection and eradication of disease that can be carried out on the knee cannot be carried out on the spinal column, with the spinal cord coursing down the canal made by the very bones affected.

It is impossible to speak at any length of the methods best suited to the different joints. The upper extremity, since weight-bearing is not required of it, lends itself more readily to conservative treatment. However, the wrist and the elbow, and the ankle, for various reasons, are not readily treated by operation, and the percentage of cases of tuberculosis of the ankle that come to amputation is higher than that of any other joint. The knee, spinal column, shoulder, and hip, in the order named, are suitable for operative procedures, and I shall briefly discuss the various types of operative measures that may be employed.

SELECTION OF THE PATIENT

Patients for operative treatment should be beyond the age of puberty, should be free of active pulmonary disease, should not have tuberculosis of the genito-urinary tract, and should be in good general health. A tuberculous kidney may have to be removed before the joint can be operated on, for the former is a vital organ, and if the disease is localized to one kidney, that organ should be removed before the opposite kidney is affected. Radical operations should not be done if draining sinuses are present. Exceptions may be made on these points only for very good reasons.

Each patient must have a thorough physical examination before radical surgical measures are instituted. Roentgenograms of the lungs should be made; also the urine should be subjected to tests, including microscopic examination, and if blood or pus is persistently present, cystoscopic examination should be made. The temperature should be noted and examination of blood made. In adults particularly, syphilis should be ruled out. It is only by such careful selection of patients that the mortality rate can be kept within legitimate limits. In the series of more than 600 cases in which operation has been performed at the clinic, the operative mortality rate is less than 1 per cent. A follow-up study over a term of years, of these same patients who recovered from the operation, shows that even in this selected group the mortality is high, 8 per cent in cases of tuberculosis of the knee, and 20 per cent in cases of tuberculosis of the spinal column. Dissemination of the tuberculosis is the cause of death in most cases, but the comfort derived from the result of the operation is well worth while. Most of the patients who died lived from four to eight or more years after the operation, and there is reason to believe that their lives were longer and their existence much more comfortable by virtue of having undergone operation than they otherwise would have been.

TYPES OF OPERATION

Aspiration and injection of various solutions.—In the main, the results of aspiration followed by injection have been sadly disappointing. The knee is the only joint anatomically suited for such treatment, and even here evidence has not been presented that warrants its continuance. However, aspiration or biopsy for the purpose of diagnosis by laboratory examination, and by inoculation of animals, is a definitely established and useful procedure.

Amputation.—Removal of an extremity should be resorted to only for definite reasons. If, for example, a patient has persistent draining sinuses from a knee, with so much destruction that the usefulness of the joint is hopelessly destroyed, or if pain is very severe and wearing, or if a patient already is burdened with tuberculosis in the lungs, kidneys or abdomen, amputation, although only a palliative measure, may be best. Economic conditions surrounding the patient may also be a big factor. Tuberculosis of the ankle often compels amputation, because of its prolonged course, and because of poor response either to conservative measures or to procedures intended to bring about ankylosis. Advanced destruction in the knee of an elderly person also usually is best treated by amputation.

Operations leading to ankylosis or fusion.—In the adult with tuberculosis of a joint the best thing that can happen is sufficient destruction of the cartilaginous surface to bring about bony union. Spontaneous recovery, with permanently good function, in the adult is so rare that it does not pay to wait for it. In some chronic cases sufficient comfort is secured through conservative measures to enable the patients to get along, but exacerbations are common, and they usually lead to the patient accepting an operation to produce ankylosis. Arthrodesis, or fusion, is particularly applicable to the knee and shoulder, although, with modern improved technic, the hip is fast becoming more amenable to this type of operation. The operation consists in exposing the diseased surfaces of the joints, removing all the affected cartilage and bone until healthy bone is thoroughly exposed, removing also all the synovia possible, and finally reshaping and fitting the ends of the bone so that they may be held firmly together until union occurs. The finer points in technic vary, naturally, with different surgeons. In the spinal column, this type of radical operation cannot be done, but it is possible to fuse the posterior portions of the vertebræ, and to extend such fusion well above and below the affected vertebræ, by the plastic method of Hibbs or by the method of bone transplantation of Albee.

Experience with these types of operation in The Mayo Clinic has extended over many years, and the results justify adherence to the principle of radical operation, in selected cases, for tuberculous joints of adults. In 1927 we reported the results in 211 cases in which arthrodesis for tuberculosis of the knee was performed, and in 1928 I reported a series of 301 cases in which the fusion operation for tuberculosis of the spinal column was carried out. The results were good, all things considered, and many patients who had dragged themselves about for years, with the aid of crutches and braces, were enabled to discard these entirely and enter again a normal life. In a smaller series of cases in which the hip joint was involved, not as yet reported, the same proportion of satisfactory results was obtained. A painless, useful, stiff joint is preferable to a useless, more or less movable joint, and when the patient is given an explanation as to what he may expect from either conservative or operative methods, it is seldom that he fails to elect the latter.

SUMMARY

Conservative treatment has its greatest field of usefulness in treatment of children; operative treatment has its greatest field in treatment of adults. If the adult patient is in good general condition, and there are no draining sinuses, fusion should be produced when practical. The knee, spinal column, shoulder and hip are anatomically suited to a fusion operation. Each patient constitutes an individual study, and generalities, that may be true in the main may not be applicable to the individual.

OBSERVATIONS IN THE DIAGNOSIS OF GALLBLADDER DISEASE*

Max H. Hoffman, M.D.
Saint Paul

GALLBLADDER disease is said to be the most common organic cause of organic digestive disturbances in the adult. It has been roughly calculated that over 20 per cent of all adults presenting symptoms referable to the digestive tract have pathology in this organ.[1] This figure is not difficult to believe, when we note that the statistics of several series of routine post-mortem examinations show that 4 to 10 per cent[2] of all cases have gallstones.

The diagnosis of cholecystic disease is often not easy. Atypical clinical pictures are very confusing to the clinician and frequently it is impossible to make a definite diagnosis. Since the introduction of the Graham-Cole method of visualizing the gallbladder, a renewed interest has been stimulated in an attempt to make an earlier diagnosis of cholecystic disease. This method of examination has proved itself to be a great aid to the diagnostician. Much has been claimed by certain writers for the value of Meltzer-Lyons method of studying the biliary fluid by means of a duodenal tube. Many who have given this test a fair trial feel that its value can be seriously questioned.

This study represents an analyses of 155 cases that presented evidence of a sufficient degree to warrant gallbladder removal. An attempt was made to determine the accuracy of the diagnosis and the reliability of various diagnostic procedures, such as X-ray and physical examination, and symptomatology. All the patients in this group were operated upon by Dr. Arnold Schwyzer, and the pathological notes were taken from his operative descriptions and the laboratory reports.

The gallbladder was said to be diseased if any of the following observations were made:

1. Thickening of the wall or changes in color or texture indicating fibrosis.
2. Stones in the gallbladder or in the cystic duct.
3. Changes in the mucosa indicating inflammation or cholesterin deposits.
4. Thickening of the gallbladder bed with changes in the adjacent liver tissue.
5. Round cell infiltration in the gallbladder wall.
6. Positive cultures in the bile or gallbladder wall.

This is, of course, a classification devised for this study, and in no sense is it to be construed as the final word in classifying diseased gallbladders. It is often difficult to say just when a gallbladder is pathological. Does a positive culture with a normal histological structure indicate disease?[3] Is thickening of the region around the opening of the cystic duct, with the remainder of the gallbladder normal, an indication of pathology?

One hundred and seventeen of the patients operated upon had stones in the gallbladder or in the cystic duct. This is 76.5 per cent of all the cases. One had a carcinomatous gallbladder, two had benign tumors, and three empyema. The remainder, diagnosed as being pathological, had one or more of the findings listed above. Eleven cases (7 per cent) were called normal or questionable. For purposes of discussion, we will separate the pathological cases from the group that showed no pathology at the operation.

SYMPTOMATOLOGY

Without question the most important single diagnostic procedure is the securing of a careful history dating back to the first appearance of digestive disturbances or pain. The patient often needs considerable prodding in order to remember the mild pains and digestive upsets that occurred a number of years before. Complete freedom from distress of any kind may be present for years after the initial attack.

The symptomatology of gallbladder disease has its origin either in the over-distended gallbladder itself or by reflex or direct action of the diseased gallbladder on the adjacent organs, notably the stomach, pancreas, and intestinal tract. Alvarez[4] "reverse peristalses syndrome" plays a very prominent part in the production of the discomfort.

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*Thesis presented before the Minnesota Academy of Medicine, October 14, 1931.

Pain.—Pain is the outstanding symptom that brings the patient to the physician. Although it appears that severe pain is a late development in the course of the disease, the earlier digestive symptoms are often not sufficiently severe to cause the patient to seek relief. Several of our group gave a history of having had the first attack twenty-five to thirty years before coming to the office, the intervening period having been free from any severe pains. Many gave a history of periods lasting several years between attacks that were free from symptoms. The intensity varied from slight pains bordering on discomfort to very severe colicky attacks that required large doses of morphine for relief.

Most of the patients complained of pain in the upper abdomen. In our group, six patients had no pain at all. Sixty-one patients (40 per cent) complained of pain in the upper right abdomen, below the costal margins, and radiating around to the back. All of these individuals had pain occurring in attacks. This, of course, is the most typical type of gallbladder pain and corresponds to the textbook description of pain occurring in an attack of gallbladder colic. Forty-three had pain located in and to the right of the epigastrium that did not radiate to the back. In many of these the pain also came on in attacks, but much less frequently than in the group in which the pain was in the right hypochondrium.

It was noted that frequently in the early attacks, the pains were limited to the epigastrium, and in the later attacks it shifted to the right hypochondrium and back. In one patient it was limited to the right shoulder, in one to the interscapular region, and in five the pain was in the lower right abdomen. The remainder of the patients had pain mostly in the right abdomen, or across the abdomen, but not well localized. The frequent association of gallbladder disease with appendicitis and duodenal ulcer must be borne in mind. In our group we had no cases in which the pain was limited to the left side of the abdomen.[5] This type of pain has been described and is explained either as referred pain or pain due to the spasm of the pylorus that so frequently occurs in gallbladder disease.

It is well known that attacks of pain occurring at night and awakening the individual from sleep are frequently a part of the history of those who suffer from duodenal ulcer. In fact it occurs so frequently that it is considered almost pathognomonic of this disease. For a number of years Dr. Arnold Schwyzer has emphasized the importance of night pains, occurring in gallbladder disease, especially those pains occurring after 2 A. M. There has been an attempt to explain this phenomenon as being the result of small stones floating into the cystic duct when the patient assumes a horizontal position. We found that one-third of our patients had night pains of the type described above. Many of them, however, occurred before 2 A. M. We also found that it occurred just about as frequently in those who had cholecystitis without stones as in those patients who had stones.

It would seem that night pains could be much better explained by the failure of the diseased gallbladder to empty properly at night when the stimulus for emptying, *i.e.*, gastric contraction and food ingestion is withdrawn. The gallbladder, in failing to empty, becomes over-distended and causes pain.

Dyspepsia.—Dr. Alvarez[4] has called attention to a group of symptoms that he has termed "the reverse peristalsis syndrome." These symptoms are nausea, vomiting, belching, bloating and pyrosis. Although they are present in many states causing digestive disturbances, including that large group termed functional indigestion, he believes this syndrome is often an early finding in cholecystic dysfunction. In our group, six patients had no definite history of pain, but presented one or more of the above complaints.

Nausea and vomiting were present in slightly over one-third of the cases, but in the great majority only during an attack, and it was usually accompanied by bloating and belching. It was rather surprising to find that relatively few patients carried the digestive disturbances through the periods between the attacks. Those that had trouble during this period were bothered mostly with bloating and belching. Nausea and vomiting were conspicuously absent.

We were unable to find that there was any particular food that uniformly caused these patients distress. Fats are said to be eaten with difficulty, but in our group there was no good evidence for this statement. Nor were we able to find that any particular food, or foods in general were capable of producing an attack. The patient is always searching for a cause, and usually ascribes it to something that was eaten in the previous meal.

Physical Findings.—The only physical findings that seem to be of any importance are tenderness, palpation of the enlarged gall bladder, and jaundice. Of these, tenderness is by far the most frequent and most important sign. It was present in about half (78) the cases of our group, usually during and for a short time after the attack. In seventy-four of these cases it was in the upper right abdomen. In four cases it was across the upper abdomen. About half of the group had no history of ever having had any tenderness. Two patients had muscular resistance without soreness. When present, it is an extremely valuable finding, but its absence should not mislead the clinician in his search for gallbladder disease. When ordinary palpation fails, tenderness can often be elicited by having the patient sit up and lean forward; then, with the physician behind, the examining fingers can be pressed deeply under the ribs.

The gallbladder was palpated in only three patients, two having empyema and one carcinoma. Some writers[6] claim to be able to feel the gallbladder in a large percentage of their cases. It would seem, however, that the location of this organ, together with the softness of the tissues around it, would make it very difficult to palpate. When it is palpable, it always means that a pathological condition is present.

It is generally believed that jaundice is a frequent occurrence in gallbladder disease. Only eleven patients (less than 8 per cent) had jaundice at one time or the other. In three cases it was questionable. No routine examination was made to determine the presence of bilirubinemia.

CHOLECYSTOGRAPHY

The Cole-Graham method of examining the gallbladder by means of a dye and X-ray has superseded the older indirect X-ray examinations. This method is far from infallible, and its accuracy depends a great deal upon the experience of the interpreter and the technic used.

There are also sources of error that cannot be controlled. If we recall that the appearance of the dye in the gallbladder depends upon its first being absorbed from the intestinal tract and then excreted by the liver, we can understand that the concentration of the dye does not always represent the functional state of the gallbladder. For that reason we cannot accept the lessened intensity of the shadow as always indicating disease when the oral method is used.

However, in spite of the factors that affect the efficiency of this test, it is a valuable aid to the diagnostician, and taken together with the clinical picture, it has markedly increased the percentage of correct diagnoses. It should be borne in mind that a failure of the dye to appear does not always mean gallbladder disease. Nor does a normal shadow always signify a normal gallbladder.

Cholecystographic studies were made in 122 cases by the oral method. A diagnosis of pathological gallbladder was made in ninety-eight and fourteen were called normal. In the group diagnosed as being pathological, the percentage of correct diagnoses according to the cholecystographic criteria of pathology was as follows:

1. Nonvisualization of the gall bladder shadow. 40 cases. 29 showed stones, 10 had other definite pathology, and one was normal.
   Percentage of correct diagnoses........................97.5%
2. Diagnosis of stones, *i.e.,* stones visualized. 40 cases. 38 showed stones, one had other pathology, one was normal.
   Percentage of correct diagnoses........................95%
3. Faint visualization. 13 cases. 4 showed stones, 7 had definite pathology, and 2 were normal.
   Percentage of correct diagnoses........................85%
4. Irregular filling. 5 cases.
   4 were normal, one was pathological.
   Percentage of correct diagnoses........................20%

Of the group diagnosed as being pathological, according to the Graham-Cole test, eight were normal and ninety pathological at operation: a percentage of correct diagnoses of 92 per cent. The greatest number of errors occurred in the group where the gallbladder was called abnormal because of an irregular filling. In that group the diagnosis was correct in only one out of five cases. Obviously, then, an irregular shadow is a poor basis for making a diagnosis of pathology.

In the first group, where the diagnosis of pathology was based on the nonvisualization of the gallbladder shadow, we had a very high percentage of correct diagnoses, 97.5 per cent; a figure higher than the true value of this finding would warrant. On several occasions we have failed to secure a filling of the gall bladder on the first examination, and later a normal response was present when the examination was repeated.

A diagnosis of cholelithiasis can be made only if the stones are visualized. Usually there is not much difficulty in interpreting stone shadows. However, there are two sources of error that must be guarded against. The negative shadows cast by cholesterin stones may be simulated very closely by bubbles of gas in the bowel. Frequently these negative shadows are called stones, but a little experience will usually enable one to differentiate them correctly. Another source of error occurs in those cases of stones in which the gallbladder fills very well with the dye. The intense shadow of the dye obscures the shadows cast by the stones. As Kirklin has pointed out, if the gallbladder is only partly emptied by a fatty meal, the shadows of the stones will be seen; but if it completely empties, the stones will often be missed.

There were fourteen cases in which the X-ray report indicated a normal functioning gallbladder. Of this group, six were definitely pathological. Three had pericystic adhesions of a degree and character that were not considered to be normal. Five were normal. Only one gallbladder in this group contained stones. If we were to exclude the group with adhesions as being pathological there would still be an error in diagnosis of 43 per cent. It is a well known fact that a pathological gall bladder can often concentrate the dye very well, even when numerous stones are present.

COMMENT

Of the entire group of 155 patients operated upon, eleven were considered as having no demonstrable pathology in their gallbladders, giving a percentage of correct diagnoses slightly over 92 per cent. Of the 92 per cent that showed disease, 81 per cent consisted of stones. This figure indicates pretty well that we have selected for operation a group that would present rather definite symptoms. From the standpoint of conservative surgery, this selection is very good, but it probably also means that we are making a definite diagnosis of gallbladder disease in only those cases that present a more advanced picture. Mentzer, at the Mayo Clinic, in 1,647 consecutive autopsy examinations, found that 37 per cent of the patients had cholesteroses of the gallbladder and 20 per cent of these had stones. If this figure gives us a true indication of the incidence of cholecystic disease, we must either be missing a large number of cases or must conclude that many of them do not ever produce symptoms, or possibly only in the late stages. It has been claimed that the early symptoms are those of digestive dysfunction; but we have been unable to find that these symptoms are in any way diagnostic: they merely make us suspect the presence of gallbladder disease. Some of our patients with advanced pathological changes had no digestive trouble except during and for a short time after an attack.

Pain is by far the most dependable finding, especially if it occurs in the upper right abdomen and at night after 2 A. M. In our group of pathological cases 34 per cent of the patients had night pains, whereas in the group of normal cases, only two patients, or 14 per cent, had similar pains.

The degree of pathology present and the intensity of the distress do not bear any definite relationship to each other. As a whole the patients with stones complain of more severe pain than those without stones. However, some with only a small amount of pathology had very severe symptoms while others with advanced changes had comparatively little.

Cholecystography is supposed to be a test of gallbladder function, and for that reason is considered by its discoverers to be especially valuable as a means of detecting early cases of gallbladder disease, where there are only slight pathological changes but considerable functional disturbance. If that were true, why do we so often find a good concentration of the dye with good emptying in the presence of stones and other disease? The answer to this question would indicate that stones may be present with a functionally intact gallbladder mucosa, and for a long time produce no symptoms. However, in spite of the deficiencies of this method, it has proved itself to be of inestimable value as a means of corroborating our clinical impression, and it often will make a definite diagnosis of gall-bladder disease where it was not suspected. In the absence of pain, one hesitates to make a diagnosis unless the cholecystograms indicate that there is some disturbance of the function of the gallbladder.

We have attempted to study the group of eleven cases where no pathology was found at operation by means of the follow-up notes on their records, and by sending them a questionnaire. They were asked if they still had pain and to locate and describe the character of the pain, the type of digestive trouble that was present, and whether or not they had achieved the relief that they had hoped for when they had consented to undergo an operation. Only seven questionnaires were returned. Of these, two were completely relieved of their symptoms. The gallbladder at operation in one of these cases was wrinkled and showed signs of recent distention with no other pathology. Another of this group who had a history of having had an operation for a duodenal ulcer, but who also had a positive Graham-Cole test, received no relief from the operation. The fourth case, before the operation complained of occasional diarrhea and abdominal pains. The pains were epigastric, occurred in attacks, and radiated to the shoulder blade. The Graham-Cole test showed an irregular shadow. At operation the gallbladder was normal. She stated in the questionnaire that the epigastric pain was gone, but the diarrhea and abdominal cramps were very severe. She did not think the operation helped her very much. Three of the seven patients who returned the questionnaire complained of diarrhea. It is not at all clear as to just what this means. It is well known that diarrhea fairly frequently accompanies cholecystitis and is explained by the decrease in the amount of acid secreted by the stomach. However, there does not appear to be any uniformity of opinion regarding the effect of gallbladder disease on gastric secretion, nor do we know a great deal about the effect of the gallbladder on the intestinal tract. The three other patients who returned the questionnaire did not obtain much relief.

Of the remaining four who failed to answer the questionnaire, the follow-up notes indicate that two had complete relief and two were not benefited. Three of the four had negative Graham-Cole tests; one was positive.

Of the eleven patients with a normal gallbladder, four had complete relief. Were these cases of functional gallbladder disorder, and is there such a thing as dyskinesia of the gallbladder? Dr. Boyden's work on the function of the gallbladder opens up a method of investigating this subject. It was also interesting to note that in this group of normal gallbladders there were a number of X-ray diagnoses of pathology, based on irregular filling, and one report of stones in which the shadow was cast by a gas bubble. With the increased experience that we now have in interpreting cholecystograms, most of them would be called normal.

As a whole the symptoms and signs presented by the group with normal gallbladders did not differ greatly from those in the definitely diseased group.

On the basis of this study it is felt that there is no group of symptoms that are at all characteristic or pathognomonic for all cases of gallbladder disease. The diagnosis is made primarily on the clinical findings, the dye test usually serving to give additional evidence. In the absence of very definite symptoms or positive physical findings, the diagnosis of gallbladder disease is always uncertain, and even with a typical history and X-ray findings all pointing to a diseased gallbladder, the laboratory will occasionally report—no pathology.

SUMMARY

1. This study is an analysis of 155 patients who presented symptoms that warranted the removal of their gallbladders.
2. The diagnosis was correct in slightly over 90 per cent. Stones were found in 77 per cent of cases.
3. Pain was considered to be the most reliable symptom. Night pains occurred in 38 per cent of the pathological cases, and, in the absence of a definite peptic ulcer history, is thought to definitely indicate the presence of gallbladder disease.
4. Digestive symptoms, although suggestive of gallbladder disease, are not of great diagnostic value.
5. The Graham-Cole test is of unquestionable value if the gallbladder fails to fill or if stones are visualized. The other findings are not considered to be very reliable.
6. The eleven normal cases were studied and were found to have about the same symptoms as the pathological cases. Four were completely relieved of their symptoms by the removal of their gallbladders.

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AVERAGE OPTIMUM DOSAGE OF COD LIVER OIL

The Council on Pharmacy and Chemistry reports that at present the recommended dosages of cod liver oil differ widely. In part, the varying effects that have been reported may no doubt be explained by the unlike activity of different brands of cod liver oil. Thus, while the U. S. Pharmacopeia permits the claim that the product is biologically standardized if it contains 50 vitamin A units per gram as determined by the method given, certain brands now in New and Nonofficial Remedies guarantee a potency of 1,000 U. S. P. vitamin A units per gram, and none contains less than 500 units. The vitamin D potency of cod liver oil is probably still more uncertain, since no official method of assay has been adopted; hence it is most difficult to compare different brands of cod liver oil even if the vitamin D potency and method of assay are declared. In view of the foregoing situation, the Council referee in charge of cod liver oil and cod liver oil preparations believed that some effort should be made to ascertain the amount of cod liver oil that must be administered under ordinary conditions to obtain the effects attributable to cod liver oil. With a view to obtaining an expression in regard to the dosage of cod liver oil, an inquiry was formulated and sent to nineteen pediatricians. From the replies received it was noted that little reference is made to the possible physiologic value of the vitamin A of cod liver oil, and that the consideration of dosage is expressed wholly in relation to the vitamin D content, or in terms of its effects in overcoming the relatively obvious physical manifestations of rickets. In all the opinions cited, the authors apparently recognize the added value of vitamin A and prescribe cod liver oil in preference to plain viosterol. Viosterol is favored, however, but only as a supplement, such as cod liver oil with viosterol 10 D. Most of the pediatricians quoted seem to agree on a dosage of 3 teaspoonfuls daily as amply sufficient to prevent and cure clinically evident rickets. In contrast to the practice of physicians in former years, most of the pediatricians begin the administration of cod liver oil at a time when the growth begins to accelerate—if not within two weeks, then at least before the end of the first month—reaching the maximum dosage usually during the third and rarely later than the fourth month, thus usually aborting the rickets in its earliest incipience and hence obviating the use of large doses later. There appears to be general agreement that it is only during these first two or three months of most rapid growth that the child requires its maximum dosage of cod liver oil, which may be continued as an ample dosage on up to 2 years of age. The Council has decided that a dosage of 3 teaspoonfuls (12 c.c.; 3 fluidrachms) daily, may tentatively be set as the standard optimum dosage of cod liver oil for the average infant, at 3 months of age. (Jour. A. M. A., January 23, 1932, p. 316.)

DIAGNOSIS AND MANAGEMENT OF CORONARY ARTERIAL DISEASE*

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William Harvey,[1] in one of his letters written in 1653, appears to have given the first definite account of a clinical picture associated with diseased coronary vessels demonstrated at autopsy. The following is quoted from Harvey's description: "I will add another observation, a noble Knight Baronet Sir Robert Darcie, about the middle of his age, did often complain of an oppressive pain in his breast, especially in the night time, sometimes fearing suffocation by a Paroxisme, he lead an unquiet and anxious life, using the Counsel of all Physicians, and taking many things in vain, at last the disease prevailing, he becomes cachectic and hydropick, and at last opprest in a signal-paroxism he died. In his Corps, in the presence of Dr. Argent, who at that time was President of the College of Physicians, and Dr. George, a rare divine, and a good Preacher, by the hindrance of the passage of the blood out of the left ventricle into the arteries, the wall of the left ventricle itself (which is seen to be thick and strong enough) was broken, and poured forth blood at a wide hole, for it was a hole so big that it could easily receive one of my fingers."

In 1768, Heberden[2] published his masterly description of a clinical picture to which he gave the name angina pectoris. Shortly after this, Jenner and Parry ascribed this condition to changes in the coronary vessels. An extensive literature developed, most of which consisted of attempts either to prove or disprove the relationship between coronary disease and angina pectoris. Thus Huchard[3] claimed that angina pectoris and coronary disease were practically synonymous, while Albutt[4] did not consider coronary sclerosis of any clinical significance, as the following statement indicates: "It is freely admitted that coronary disease may and for the most part does pursue its silent way without anginous or other storms." This uncertainty as to the clinical aspect of coronary sclerosis is shown by the fact that in most of the modern textbooks and systems of medicine there is no attempt to discuss coronary disease as a clinical entity. We have thus a common pathological condition which has been recognized for several hundred years, but which, apparently, still has no clearly understood and generally accepted clinical picture.

In order to study the clinical features of this condition an analysis was made of 113 cases from the Department of Pathology of the University of Minnesota.[5] All those included showed severe coronary disease with marked narrowing and partial obliteration of one or more large arteries, and usually definite fibrosis or softening of the myocardium. The clinical features discussed in the present report are derived from an analysis of the clinical data of this series of autopsies with the additional details obtained from observation of a group of clinical cases over a period of five years.

Age and Sex.—The average age at the time of death in the autopsied group was fifty-nine and two-fifths years. The youngest was thirty-two, and the oldest eighty-eight years. The age distribution is shown in the accompanying table (Table 1).

TABLE 1.—AGE AT THE TIME OF DEATH OF 110 CASES OF CORONARY DISEASE

Age	No. of Cases
30 to 39	2
40 to 49	17
50 to 59	28
60 to 69	45
70 to 79	15
80 to 89	3

There was a definite preponderance of males, the ratio of males to females being three to one.

Types of Clinical Picture.—The outstanding clinical feature was the tendency for the symptoms to occur in attacks. This was true in about 60 per cent, while in the remainder the symptoms were those of progressive heart failure, and acute paroxysms were not prominent. The attacks consisted of an oppressive pain in the chest in 75 per cent, and were localized to the abdomen in 25 per cent. Attacks of acute respiratory distress were present in about 10 per cent of the cases. On further analysis it was found that the clinical picture differed in two important respects: (1) as to size of the heart; and (2) as to presence or absence of congestive heart failure. Thus the heart was within normal limits as to size in 39.9 per cent and was enlarged in 60.1 per cent. Congestive heart failure, judged by clinical signs and postmortem findings, was present in 40.6 per cent and absent in 59.3 per cent.

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*Read before the Northern Minnesota Medical Association, Moorhead, Minnesota, September 20, 1930. From the Department of Medicine, University of Minnesota, Medical Service, General Hospital.

From the standpoint of symptomatology the study of this autopsy material indicated that there were two distinct types of coronary disease: (1) a group in which the symptoms consisted of attacks of pain or acute respiratory distress, without evidence of congestive heart failure; and (2) a group in which the outstanding symptoms were those of congestive heart failure, dyspnea, cough and edema (Table 2).

TABLE 2.—TYPES OF CORONARY SCLEROSIS (113 AUTOPSIES)

	Per cent
Anginal Syndrome, liver congestion absent at autopsy	59
1. Heart normal in size	37
2. Heart enlarged	22
Congestive Heart Failure, liver congestion present at autopsy	41
1. Heart normal in size	2
2. Heart enlarged	39

Diagnosis.—The diagnosis of coronary disease with congestive heart failure will not be considered in this discussion. This type is intimately associated with hypertension heart and presents but few features which differentiate it from hypertension heart without coronary disease. Furthermore, the management is practically the same as for congestive heart failure from any other cause. This report is concerned only with that type of coronary disease in which the manifestations consist of paroxysms of pain or acute dyspnea unassociated with congestive heart failure. This group may be termed the anginal group, if it be understood that this term is used in a broad sense for attacks of pain or paroxysmal dyspnea of cardiac origin, with a tendency to sudden death. Since there are usually no diagnostic objective clinical features in this type, the diagnosis is frequently very difficult. The condition is easly recognized when the symptoms consist of the typical attack of angina pectoris, as first described by Heberden,[2] in 1768. However, attacks approaching this typical picture occur in not more than one-half of the cases. There is a great variety of atypical types, many of which present a clinical picture bearing little resemblance to the characteristic attack of angina pectoris. In such cases there are a number of points which require careful consideration, any or all of which may be of aid in arriving at a diagnosis. These diagnostic features may be enumerated as shown in Tables 3 and 4.

TABLE 3.—GENERAL DIAGNOSTIC FEATURES

1. Age
2. Sex
3. Family History
4. Associated Conditions
   a. Diabetes
   b. Hypertension
5. Habitus

GENERAL DIAGNOSTIC FEATURES

Age.—The average age at the time of death of 113 autopsied cases of coronary disease was fifty-nine and two-fifths years. Sixty-five per cent of the entire group were between the ages of fifty and seventy years. This corresponds to several other series which have been reported. The youngest patient that I have encountered with coronary disease proved by the electrocardiogram was thirty-five years of age and I have seen a considerable number between forty and fifty.

Sex.—In the autopsied group the ratio of males to females was three to one. This, however, includes also those terminating in congestive heart failure. In those presenting the anginal manifestations the preponderance of males was much greater, being about eight males to one female.

Family History.—Heredity seems to be an important factor in the etiology of coronary disease. I have seen frequent instances of several members of a family afflicted with the condition. A history of coronary disease in the family should have some bearing on the diagnosis.

Associated Conditions.—There are but two conditions which have a definite association with coronary disease—diabetes and hypertension. In a study by the writer of one hundred autopsies on diabetics,[6] it was found that coronary disease was present in 52 per cent of diabetics above the age of fifty, as compared with 8 per cent in non-diabetics of this age. Chart 1 graphically shows the incidence of coronary disease in diabetics and non-diabetics. Likewise, in hypertension heart at autopsy the incidence of coronary disease is about five times that of general autopsy material. The clinician therefore should consider more strongly the possibility of coronary disease when either diabetes or hypertension is present.

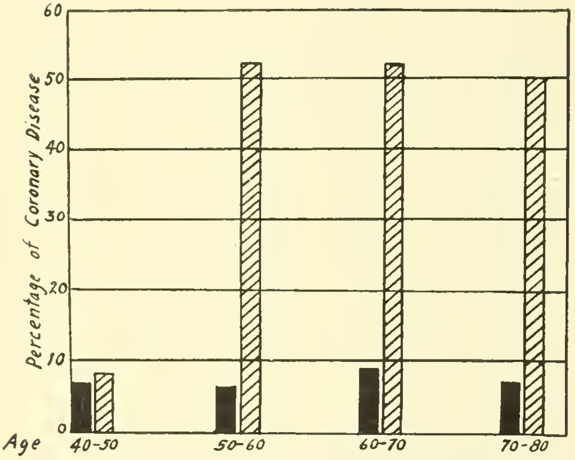

Chart 1.—Comparison of the incidence of coronary disease in diabetics and non-diabetics. (Striped columns, diabetics; solid black columns, non-diabetics.)

Habitus.—There is some correlation between the type of body build and coronary disease. The condition is extremely rare in the long, angular, asthenic type. It occurs most frequently in the short, broad, hypersthenic individual. Next in frequency is the tall, broad-chested type. It is true, however, that this condition may occur in an individual of normal habitus, but with less frequency. Levine and Brown,[7] in discussing coronary thrombosis, describe the type susceptible to this condition as a well-set person, somewhat overweight, often of considerable physical strength, who has enjoyed unusually good health.

SPECIAL DIAGNOSTIC FEATURES

Of greatest importance in the diagnosis of the anginal type of coronary disease is a careful and detailed analysis of the various features of the attack. When the major symptom is pain, there are certain characteristics so constant and typical of the pain of coronary disease that they are of great diagnostic import, while others are so variable and uncertain that they are of decidedly less significance.

TABLE 4.—SPECIAL DIAGNOSTIC FEATURES

A. Characteristics of the Attack
  1. Pain
    a. Site of pain
    b. Radiation
    c. Type of pain
    d. Factors inducing attack—exertion, emotion, large meals, flatulency
    e. Cessation of attack on rest
    f. Duration—condition between attacks
    g. Mental reaction
    h. Gastro-intestinal manifestations
    i. Reaction to nitrites
  2. Acute Dyspnea
    a. Sudden onset—usually nocturnal
    b. Examination of lungs, negative, or fine, moist râles or bronchial wheezes
B. Physical Examination of the Heart
  1. Enlargement—definite enlargement usually absent
  2. Auscultation—usually normal, first sound may be muffled or split
  3. Cardiac rhythm
C. Electrocardiogram—positive in about 70 per cent

Site of Pain.—In some cases the pain may be localized to any part of the chest or even to the back. However, it is usually situated behind the sternum, either at the upper or lower end. In about 25 per cent of the cases it is localized in the epigastrium. Pain limited to either the left or right side of the chest is infrequent as compared to the central chest location. A substernal or epigastric localization of the pain should always arouse the suspicion of coronary disease.

Radiation.—Radiation to the left shoulder, arm and forearm has been considered as characteristic for the anginal type of pain. An analysis of the autopsied and clinical cases indicates that this is not as prominent nor as constant a feature as has been supposed. In the records of fifty cases it was an exception for the patient to voluntarily describe this type of pain radiation and this has usually been absent even on direct questioning. In rare cases the radiation is to the right side of the chest and occasionally to the neck and lower jaw. I have seen several individuals in whom the pain was present almost entirely in the lower jaw and who, suspecting trouble in the teeth, had first consulted a dentist. When the pain is situated in the epigastrium, the patient often states that it spreads upward into the chest. It is true that radiation to the inside of the left arm, the area supplied by the first two dorsal roots, strongly indicates that the pain is of coronary disease origin, but the absence of such radiation does not in any way exclude the possibility of coronary disease.

Type of Pain.—The character of the pain is probably the most constant feature of coronary disease, certainly more constant than the site the radiation and, therefore, of greater diagnostic importance. The pain typically consists of a sense of oppression. This varies from a slight pressure behind the sternum or in the epigastrium to an intense vise-like sensation with a feeling of suffocation. Sharp, lancinating pains are extremely rare in coronary disease and very frequent in the various noncardiac types of chest pain. This was emphasized by Kilgore[8] in a comparison of chest pains in one hundred noncardiacs and thirty-six patients with pain of cardiac origin. Of the thirty-six cases of cardiac pain, the distress was described as lancinating in but four instances, and in but one case was this unassociated with pain of a compression character. Kilgore's studies also demonstrate that true cardiac pain is most frequently substernal in location, while the most frequent site in the noncardiac group is in the left chest. Chart 2, constructed from the data of Kilgore, is a graphic comparison of the type and site of pain in the cardiac and non-cardiac groups. This difference in the character of the pain frequently serves to differentiate a true coronary disease pain from various functional conditions. Our own observations agree with those of Kilgore. In only two of fifty cases of coronary disease was the pain described as of a sharp, shooting character. From a diagnostic standpoint, therefore, the presence of a compression pain is strong support for a diagnosis of coronary disease. If the pain is sharp, sticking and lancinating in character, the probability is that it is of non-cardiac origin.

Factors Inducing Attack.—In general, the factors predisposing to an attack are overexertion, emotional strain and overeating. Of these the relation to exertion is most important, for noncardiac pains are frequently induced by emotional excitement, as in the psychoneurotic, and by over-eating, as in certain gastrointestinal conditions. The importance of these predisposing factors varies in different cases. Some patients tolerate physical activity fairly well, but are very susceptible to any emotional or mental strain. Hirschfelder[9] points out that while mental excitement, anxiety, and especially anger, are frequent factors in inducing an attack, the more gentle emotions, such as pity and sorrow, even when felt intensely, have little effect.

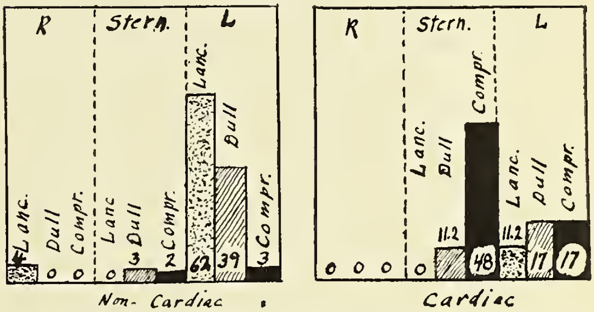

Chart 2.—Site and type of pain in non-cardiacs and cardiacs (Kilgore). Stern. indicates mid-chest; R and L indicate right and left chest; Lanc. indicates lancinating; and Compr. indicates compression type of pain.

Cessation of Attack on Rest.—The fact that effort induces a pain in the chest and rest causes it to subside is one of the more important diagnostic points. This relationship to effort and rest is usually so definite that the patient almost invariably volunteers the information without questioning. Chest pains of other sources occasionally show some relief on rest. The effect, however, is much less marked and usually this is elicited only after the patient is directly questioned concerning it.

Although the relationship of the anginal pain to effort and rest is usually definite, the attacks not infrequently occur while the patient is at rest. This occurred in five of fifty cases and in three instances the usual relationship was reversed in that the pain was relieved by moderate exertion.

Duration of Attack.—A continuous pain in the chest practically excludes coronary disease as a basis. One of the most important diagnostic features of the pain of coronary disease is the paroxysmal character, the attack usually lasting from one to five minutes. Occasionally the pain lasts for hours or several days, and then the patient presents the features characteristic of an acute occlusion of a coronary branch by a thrombus. It also is to be emphasized that one of the constant characteristics is the abrupt onset and sudden disappearance of the paroxysm. Between attacks the patient is usually in such excellent health that it is difficult for those about him to realize that he is suffering from a serious disease.

Mental Reaction.—Too much reliance cannot be placed on the presence or absence of any characteristic psychic reaction with the attack. It is true that a mental anguish with fear of impending death, so prominent in John Hunter's case, is frequently associated with the attack of anginal pain, and the presence of such a reaction is of some diagnostic value. However, many cases have repeated attacks and go on to death, suffering little or no psychic reaction with the paroxysms. Furthermore, many functional cases suffer lancinating chest pains, associated with great fear and often state that they feel as if they were about to die.

Gastrointestinal Manifestations.—The pain of coronary disease is frequently localized to the epigastrium. In the group of 113 autopsied cases the distress was referred to the upper abdomen in 25 per cent. Belching was not uncommon with an attack and the patient frequently was relieved by eructation of gas. It is often difficult to convince the patient that he is not suffering from a gastrointestinal condition. The severe prolonged pain of coronary thrombosis may suggest an acute abdominal condition. Vomiting is not rare and there may be marked tenderness and rigidity in the upper abdomen. It is frequently necessary to consider every diagnostic point to differentiate between a coronary occlusion and a surgical abdomen. The most important points in favor of coronary disease are muffled heart sounds or gallop rhythm, the presence of cyanosis, and dyspnea and characteristic electrocardiographic alterations. Dr. Arthur Zierold[10] has made a suggestion which should be helpful in differentiating an attack of pain of coronary origin from that of an acute abdominal condition. The spasm of the abdominal muscles associated with a diseased viscus is the result of a reflex, the afferent impulses passing to that portion of the spinal cord which is in segmental relationship to this viscus. The reflex is completed by efferent impulses passing from these segments of the cord to the muscles supplied by them. The afferent supply of the heart affects the somatic nerves above the sixth dorsal segment. The nerves from these segments do not supply the abdominal muscles so that a reflex spasm is not possible in a pain of cardiac origin. The muscle rigidity with the cardiac pain is merely a protective spasm resulting from cortical stimulation by the excessive pain stimulus. Dr. Zierold points out that morphine markedly depresses the cortical centers but has no such effect on the spinal reflexes. In the differentiation of a cardiac pain from a pain of a diseased abdominal viscus, morphine may be given so that the pain is relieved. A disappearance of the muscle spasm is strong evidence of a cardiac origin of the pain. If the spasm persists the evidence is in favor of a diseased abdominal organ.

Relief by Nitrites.—It is frequently of value to use amyl nitrite or tablets of nitroglycerin as a therapeutic test. Pearls of amyl nitrite or hypodermic tablets of nitroglycerin, gr. 1/150 to 1/100, are prescribed and the patient directed to inhale the amyl nitrite or place a tablet of nitroglycerin under the tongue immediately at the onset of an attack. If unmistakable relief is obtained within one or two minutes, it is almost certain that the pain is of coronary disease origin, especially if the same effect is obtained on several trials. The tablets are preferable to the amyl nitrite for this test, as occasionally a patient with functional disease responds either by way of suggestion, since the breaking of a pearl and inhalation of apparently potent drug may be impressive, or because relief is preferable to the objectionable odor of the amyl nitrite. It must also be remembered that it has been shown experimentally and roentgenologically that the nitrites act on the smooth muscle of the stomach and intestine. Abdominal pain has been controlled temporarily by nitrites when the pain was caused by spasm or hyperperistalsis of the stomach or intestine. The relief, however, is neither as immediate nor as striking as in the case of the pain of coronary disease. I have recently observed a patient who suffered attacks of upper abdominal pain. A diagnosis of coronary disease had previously been made, chiefly because the pain was relieved by amyl nitrite. However, although the duration of the attacks was shortened, relief was obtained only after a period of twenty minutes and after the inhalation of five or six pearls of amyl nitrite. Further examination revealed that the patient was suffering from cholelithiasis.

Acute Dyspnea.—The paroxysmal dyspnea of coronary disease has frequently been termed cardiac asthma, a rather unsatisfactory term, since it has no relationship to true allergic asthma and may have several underlying mechanisms. The attack consists of a paroxysm of acute orthopnea lasting a few minutes to several hours, coming on usually during sleep, but sometimes after exertion or over-eating. This varies in degree from a mild and short attack to an intense, agonizing distress which may end in death.

Any attack of nocturnal orthopnea starting in an individual above the age of forty should suggest a strong possibility of coronary disease. The diagnosis is usually not difficult. In contrast to the cardiac type, allergic asthma usually begins in young individuals and there is frequently a history of sensitization to foreign protein and of respiratory infections.

If the patient is seen in an attack, examination of the chest will reveal one of three conditions: (1) an absence of abnormal physical signs; (2) evidence of bronchial spasm as indicated by squeaky, wheezy rhonchi; or (3) many fine moist crepitations throughout the lungs. The first type is due to a disturbance in the respiratory center, resulting in Cheyne-Stokes breathing. The breathing is rhythmic during the day and the patient may be free of symptoms. The usual history is that just as he is dozing off at night, the patient is awakened by a paroxysm of labored breathing which forces him to sit up in bed gasping for breath. After a short period he falls asleep again, but may be awakened by similar attacks several times during the night. If the patient is carefully observed or if pneumographic tracings are taken, it will be found that a marked Cheyne-Stokes respiration is present and that the patient dozes off in periods of apnea and is awakened by one of the periods of hyperpnea. These attacks usually last for but a short time and are not very distressing except as they interfere with proper sleep.

The second type is more severe and prolonged. The acute orthopnea is due to a bronchial spasm. The onset is usually sudden and the dyspnea reaches the maximum very quickly. Inspiration and expiration are usually affected. The chest is filled with wheezy, musical bronchial râles such as occur in the true asthmatic.

The third type is the most severe and serious and may end in death. The orthopnea is a result of an acute edema of the lungs due to a sudden failure of the left ventricle. This usually occurs during the night but may be brought on by exertion, as straining at stool, or may follow a heavy meal. A painful oppression of the chest is followed by a spasmodic cough and usually an abundant expectoration of frothy pink sputum. The dyspnea is extreme and cyanosis is present. On auscultation many fine subcrepitant râles are heard first just at the bases and then throughout the lungs. The attack lasts from one-half to several hours and there is a disappearance of the signs in the lungs in a comparatively short time.

Physical Examination of the Heart.—It must be emphasized that an absence of diagnostic physical signs is the rule in coronary disease. The heart is usually normal in size although there may be some enlargement if hypertension is present. Even in such cases the cardiac dilatation is frequently so moderate that it will escape detection on physical or roentgenologic examination. In the cases with the short anginal attacks auscultation as a rule reveals no abnormality in the heart sounds. The rate and rhythm are usually normal. A muffling or splitting of the first sound at the apex may occasionally be present, a physical sign of doubtful diagnostic significance. In the prolonged attacks of pain associated with coronary thrombosis the heart sounds are usually very distant and muffled and the first sound may be reduplicated. Gallop rhythm and pulsus alternans are frequently present. Disturbances in rhythm of the heart are frequent in coronary thrombosis but rather unusual in coronary disease without thrombosis. In sixty cases of coronary sclerosis studied electrocardiographically by the writer, extra systoles were present in 18 per cent, auricular fibrillation in 6.6 per cent and complete heart block in 1.6 per cent.

In the evaluation of the significance of extra systoles, the time of onset is of great importance. In an individual above the age of forty, extra systoles of long standing are of little importance, while such an arrythmia of recent origin is suggestive of coronary disease. It is apparent that as compared to the subjective features, the objective examination is of a minor value in the diagnosis of coronary disease.

Electrocardiogram.—It is as an aid in the diagnosis of coronary disease that the string galvanometer undoubtedly has its greatest value to the clinician. Experimentally, it has been demonstrated that interference with the coronary circulation results in characteristic changes in the electrocardiogram. The writer,[11] from an electrocardiographic study of sixty cases of coronary disease, arrived at the following conclusions: The presence of a widened notched QRS or T wave inversion in significant leads is usually indicative of coronary disease. Other possible causes of such changes, as a large hypertension heart, aortic valvular disease with left ventricular dilatation, the post-diphtheritic and myxedema heart, may be easily differentiated and excluded. In the absence of these conditions the QRS and T wave alterations mentioned are diagnostic of coronary disease. Certain lesser deviations in the electrocardiogram such as low amplitude, minor notchings and depressed T wave, while not pathognomonic, should not be disregarded. When the clinical picture is suggestive, the presence of these lesser deviations should be considered as additional support for the diagnosis of coronary disease. An abnormal electrocardiogram is present in approximately 70 per cent of cases. Table 5 is a summary of the electrocardiographic findings in sixty cases of coronary disease.

TABLE 5.—ELECTROCARDIOGRAPHIC FINDINGS IN 60 CASES OF CORONARY SCLEROSIS

	Number	Per cent
Inversion of T	53	88
Lead I	24	40
Leads I and II	99	15
Leads II and III	17	28
Leads I, II and III	3	5
Coronary T (Pardee)	13	21
Changes in QRS		
Bundle branch block	6	10
Arborization block	2	3.3
Moderate notching	11	18
Slight notching	18	30
Low Voltage	9	15
Prolonged P-R	4	6.6
Arrhythmias		
Extra systoles	11	18
Auricular fibrillation	4	6.6
Complete heart block	1	1.6
Ventricular Preponderance		
Definite left	18	30
Slight left	18	30
Slight right	2	3.3

To summarize, the diagnosis of coronary disease depends on a proper evaluation of a number of points, especially in the patient's history. The string galvanometer when available is of great value. Although not essential for a correct diagnosis in many cases, the electrocardiogram is frequently of great value in confirming the clinical impression. There is no doubt that fewer cases would be overlooked if the frequency of coronary disease were appreciated and the condition constantly kept in mind. In a patient complaining of upper abdominal or chest pain, coronary disease must be considered, especially if the individual is a male, above the age of fifty and of the hypersthenic habitus. The presence of this condition in other members of the family and the association of diabetes or hypertension increases the probability of coronary disease. A careful analysis of each case, giving the proper value to the various points discussed, will usually enable the clinician to arrive at a correct diagnosis.

TREATMENT

There are two chief indications in the treatment of the anginal type of coronary disease: (1) treatment of the attack; and (2) the treatment directed at the underlying pathology and the prevention of attacks.

For the attack, the nitrites, first introduced by Sir Lauder Brunton in 1867[12] in the form of amyl nitrite, are still unsurpassed. Nitroglycerin was introduced by William Murrell in 1879.[13] The nitrites are effective in approximately 75 per cent of the cases of cardiac pain. In our experience the nitrites are about as effective regardless of whether the blood pressure is or is not elevated. The effect is much less certain if the manifestations are paroxysms of dyspnea although the same treatment should be tried. The inhalation of a "pearl" of amyl nitrite crushed in a handkerchief usually effects some relief in from thirty seconds to one minute. Nitroglycerin in the tablet form is preferable for several reasons. With the amyl nitrite the relief does not appear as certain as with nitroglycerin, especially in severe cases. Furthermore, the dosage of the amyl nitrite cannot be as accurately controlled, since this depends on the number and depth of the inhalations. The odor is frequently objectionable to the patient and those about him. Another point of practical importance, especially where attacks are frequent, is that the tablets of nitroglycerin are much less expensive. In bottles of 100 the tablets may be purchased at from seventy-five cents to one dollar, while the amyl nitrite is sold for about ten cents for each pearl. A freshly prepared hypodermic tablet of nitroglycerin gr. 1/100 or gr. 1/150, placed under the tongue, brings relief in from one to two minutes. It should be emphasized that hypodermic tablets be especially designated as the tablets for oral use dissolve more slowly and are thus less effective. When taken by stomach the drug is about one-half as effective and relief usually does not appear for about ten minutes. A frequently mentioned objection to the use of the tablets is that the drug may deteriorate in this form and thus become comparatively inert. Although this possibility theoretically exists, in practice the hypodermic tablets with the modern methods of preparation retain their potency for long periods. An unsatisfactory therapeutic effect may be due to faulty tablets, a wrong mode of administration or inadequate dosage. The physician should first proceed to examine the tablets to determine whether they are in the hypodermic form and dissolve quickly and whether they appear fresh or old, hard or discolored. He may find that the patient is taking the tablet by stomach instead of by the sublingual route. If these points are corrected and the effect is still unsatisfactory, an increase of the dosage should be tried. Ingalls and Meeker[14] emphasize the fact that large doses are often needed and when ordinary doses are ineffective the patient may obtain relief by increasing the number of tablets. Osler also states that nitroglycerin is too timidly used and then abandoned as ineffective. If the physician increases the dose gradually, no harm can come, with the exception of some headache. The patient should be warned of possible dizziness and headache, and assured that this reaction is harmless. It is frequently wise for the physician to test the tolerance of the patient in the office to determine the degree of dizziness, palpitation and headache with a certain dosage. Nitroglycerin may also be used in the form of the spirit of nitroglycerin, also known as spirit of glonoin, spirit of glyceryl trinitrate or liquor trinitri. One or two drops of this preparation placed under the tongue has the same effect as the tablet. In the use of the liquid form, the U. S. Pharmacopeia advises pouring a solution of potassium hydroxide if any is accidentally spilled, otherwise after evaporation of the alcohol, a highly explosive substance remains. The tablets are more convenient to carry and to apply. The patient must be instructed to have the drug close at hand at all times and to administer it immediately at the onset of the attack. A drink of whiskey or brandy will check the attack of pain in many cases. This was noted by Heberden in his original description in which he stated that "wine and spiritous liquors afford considerable relief."

In the prolonged and severe attacks of pain with fall of blood pressure, resulting from a thrombosis of a coronary branch, the pain is seldom relieved by nitrites and their administration may be harmful. An additional drop in the arterial pressure may occur, intensifying the degree of shock. The pain can be relieved only by morphine and the dose should usually be no less than one-half grain, which should be repeated if necessary. Smaller doses are usually ineffective in this condition.

If the attack consists of a paroxysm of dyspnea, the nitrites should be tried, but frequently are ineffective. Palmer and White,[15] in a review of a series of cases of cardiac asthma, found that nitrites gave some relief thirty-seven times, and no relief twenty-eight times. The relief is much less striking than in the cases of cardiac pain. Morphine is the most reliable remedy, regardless of whether the shortness of breath is due to edema of the lungs or bronchial spasm. If auscultation of the lungs indicates that bronchial spasm is present, adrenalin or ephedrin may be used. These drugs seem to be as effective in the attacks of bronchial spasm associated with coronary disease as in the true allergic asthma. In cases having frequent attacks, ephedrin in .050 gr. doses two or three times a day has been successful in preventing attacks. I have seen many patients in whom one capsule of ephedrin at bedtime has prevented nocturnal attacks of bronchial spasm which previously had been relieved only by a hypodermic of morphine. Bloedorn and Dickens[16] from observations on a single case conclude that ephedrin is a dangerous drug in cases showing evidence of cardiac damage, stating that it may produce acute cardiac decompensation and pulsus alternans in patients with damaged hearts. I have observed no harmful effects from the use of ephedrin in cardiacs, unless the drug was continued in a patient showing an untoward reaction, such as tachycardia, tremor, nervousness and weakness. Many of the cases of nocturnal paroxysmal dyspnea of coronary disease are associated with Cheyne-Stokes respiration, the patient awakening in the phase of hyperpnea. This abnormal type of respiration may frequently be successfully treated by the use of an ampoule of euphyllin, 0.5 gm., administered either intramuscularly or intravenously. In addition to the use of morphine, venesection is usually recommended in cases showing edema of the lungs. I have been impressed with the frequency of a shock-like condition associated with the edema of the lungs of coronary disease. The venous pressure as evidenced by collapse of the jugular veins is low, due to a peripheral circulatory failure with active dilatation of the splanchnic vessels. In such cases venesection is certainly not indicated and the procedure should be attempted only where there is evidence of increased venous pressure as indicated by distended jugular veins. Obrastzow and Strashesko[17] mention a case in which they opened the cubital vein and the venous pressure was so low that no blood was obtained.

The treatment for the purpose of preventing attacks may be divided into: (1) certain general measures to readjust the patient's activities and habits; (2) drug therapy; and (3) surgery.

General Therapeutic Measures.—The most important feature in therapy is the rearrangement of the individual's activities and habits. A life free from mental and physical strain must be ordered. Too often the physician dismisses this most important feature in therapy with the brief instruction to the patient to "take things easy." This is insufficient, for it is important to make a careful study of the activities and mental and physical habits of each patient and the factors inducing the attack. It is difficult to formulate any general rules of management as each case must be considered individually. A balance must be arranged between too much and too little restriction. Some patients require extreme limitation, others are benefited by moderate exercise. It is very seldom that complete bed rest is necessary. However, if the attacks are persistent in spite of definite restriction, rest in bed for a short period with a gradual increase in activities should be tried. It is seldom also that the patient is required to give up his business or profession. Each patient's work and his physical and mental reaction to that work must be studied. A reduction in the time and the amount of work, elimination of the factors tending to mental and emotional strain and reasonably frequent periods away from work will usually permit the patient to carry on much of his usual activity.

It is very important that a proper state of mind is established. It is necessary to impress the patient sufficiently so that he will follow instructions and yet to reassure him so that he does not become unduly apprehensive. It is surely not a successful therapeutic result to obtain a restriction of physical activities at the cost of additional mental strain. In addition the patient should be familiar with the causes which are most liable to induce an attack, such as sudden, prolonged and strenuous exertion, emotional excitement, overeating, especially if followed by some exertion, excessive use of tobacco, constipation and straining at stool. He will then be able to make an effort to avoid these predisposing factors.

A degree of physical exercise, and this varies in individuals, is not harmful and may be beneficial. The degree of exertion must always be below the pain producing level. Walking is the best form of exercise. This is well tolerated with few exceptions, if it is not done immediately after meals, in the face of a wind, or in extremes of weather. Many patients may indulge moderately in golf, especially if on a fairly level course.

Restriction in diet is important. This consists chiefly in ordering meals small in amount to prevent overloading and distension of the stomach. If the patient is overweight this will also have a favorable effect in reducing the weight. Small lunches between meals may be added if necessary. Seasoned, irritating and fried foods and those containing much roughage should be eliminated to prevent flatulence. A short rest after each meal is necessary and no exertion should be attempted for at least one-half hour. Tea and coffee may be used in moderate amounts. To eliminate coffee in an individual who is accustomed to its use is inconsistent when one considers that caffein is tri-methyl xanthin and the chief coronary dilating drugs usually administered are also xanthin derivatives. Alcohol in small amounts may be well tolerated, but overindulgence is distinctly harmful.

In all cases it is of importance to regulate the use of tobacco and in many individuals it is advisable to exclude it completely. With many patients accustomed to the use of tobacco, the smoking of part of a cigar or a cigarette after a meal promotes the desired relaxation and rest. Restriction in these cases is more beneficial than complete exclusion of tobacco. There are no conclusive clinical or experimental observations which support the theory that tobacco will cause or increase the tendency to arteriosclerosis. Albutt[18] concluded that the effect of tobacco in hyperpiesia and arteriosclerosis was negligible. Johnson[19] found in sixty patients suffering with angina pectoris that 70 per cent were smokers and 30 per cent non-smokers. Of a control group of 1,000 adult males, 81.8 per cent were smokers. His conclusion was that tobacco was a very doubtful etiological factor. Arteriosclerosis has been noted in rabbits after the injection of nicotine. These observations have been poorly controlled and conclusions from these experiments are unreliable. There is evidence, however, that tobacco may cause acute constriction of the blood vessels, and it has been noted that excessive use of tobacco may induce anginal attacks. Moschcowitz[20] reports in a group of cases a striking cessation of typical anginal attacks in heavy smokers when tobacco was withdrawn. There is no doubt that most individuals with diseased coronary vessels will be less susceptible to attacks if tobacco is definitely restricted or excluded.

Use of Coronary Dilators.—The chief drugs for this purpose are the xanthin derivatives. Caffein is trimethylxanthin, theobromin is dimethylxanthin, its isomer theophyllin is usually known the trade name of theocin. There are many compounds of these drugs, the one which has been for the longest time in general use being theobromin sodium salicylate, known as diuretin. As early as 1895 Askanazy[21] called attention to the effectiveness of this drug in anginal manifestations. In 1902 Breuer[22] confirmed the observations of Askanazy and stated on the basis of five years' experience "that he considered the use of theobromin in cardiac asthma and angina pectoris as one of the most praiseworthy therapeutic attainments of the last ten years." More recently there has become available the calcium salt of theobromin and salicylic acid known as theocalcin and a compound of theophyllin, theophyllin ethylenediamin, known by the trade name of euphyllin or metaphyllin. Experimentally it has been shown that these drugs definitely dilate the coronary arteries, increasing the flow through these vessels in doses comparable to that which can be administered therapeutically. Smith, Miller and Graber[23] show that euphyllin increases the rate of coronary flow from 40 to 90 per cent and that this gain is independent of the accelerated heart action. They state that the action of this drug compares favorably with that of glyceryl trinitrate but that the effect is much more prolonged. Caffein sodio-benzoate and theobromin sodio-salicylate have no such favorable effect on the coronary circulation. Theophyllin increased the flow from 25 to 40 per cent.

The work of Gilbert and Fenn[24] indicates that in point of efficacy the drugs assume the following order: theobromin and its derivatives, most effective; euphyllin, theophyllin sodium acetate and caffein have the least effect on the coronary circulation. Musser[25] found euphyllin very effective in the treatment of cardiac pain and paroxysmal dyspnea. Gilbert and Kerr[26] used the various compounds of theobromin and theophyllin in eighty-six cases of anginal pain. They considered that theobromin and its compounds were somewhat more effective but found that certain cases responded to euphyllin which did not respond to theobromin or its compounds. Many of the xanthin derivatives have untoward effects which limit their use. These consist of nausea, occasional emesis, burning in the epigastrium, palpitation and dizziness. With the exception of theobromin, theocalcin and euphyllin, these preparations can be used only by a few patients for more than a few days without ill effects. Our own procedure has been to use theocalcin and euphyllin alternately. Theocalcin is supplied in 7.5 grain (0.5 gm.) tablets and four to eight tablets are prescribed a day. This drug has been administered to many cases for long periods without gastric irritation and with beneficial effects in preventing anginal attacks. Euphyllin or metaphyllin is supplied in 1.5 grain (0.1 gm.) tablets and dosage varies from four to ten tablets a day. The patient is advised to use one of the preparations for from ten days to two weeks and then to shift to the other drug for the same period. Theominal, a preparation consisting of theobromin, 5 gr., and luminal, 0.5 gr., is valuable where a sedative is needed and may be used in conjunction with or alternating with euphyllin. Erythrol tetranitrate, gr. 0.5, three times daily, has been used in a small group of cases in which hypertension was present with apparently favorable results.

Surgical Measures.—In recent years much attention has been given to the surgical treatment of the anginal pain. The aim of the various methods which have been used is the interruption of the afferent nerve fibers which convey the impulses arising in the heart. The most important routes of sensory impulses from the heart are by way of the upper, middle and lower cardiac nerves to the cervical sympathetic trunk and also by way of a large number of fibers coming into the stellate ganglion. There are also lower fibers which enter the dorsal sympathetic chain. The impulses then pass from the cervico-dorsal sympathetic chain to the spinal cord by way of the rami communicantes of the upper dorsal nerves. The literature is replete with descriptions of a variety of methods for the interruption of these sensory routes. The chief point of attack has been the cervical sympathetic chain. Jonnesco[27] in 1916 first removed the upper three cervical ganglia and the first dorsal sympathetic ganglion on both sides. With this elaborate procedure he reported good results. Various less radical operations on the cervical sympathetic chain have been suggested. In 1923 Coffey and Brown[28] removed the superior cervical ganglion in five cases with relief of pain, a comparatively simple procedure. This method has been used extensively. It has been demonstrated that there are no sensory fibers in the superior cervical ganglia and there is therefore no blocking of sensory impulses by this operation. This ganglion has a purely motor function and any favorable effects following its extirpation can only be explained by a coronary vaso-dilatation resulting from a suppression of vaso-constrictor impulses. Wenckebach[29] has proposed that the sensory impulses from the heart are carried by the depressor nerve. Eppinger and Hofer[30] tried cutting the depressor nerve, and report a certain amount of relief. Cutler,[31] who in this country has had considerable experience with the various methods, states that it is doubtful whether this nerve can be identified in an operative procedure. Cutler has reviewed 120 cases subjected to various types of operation. The best results were obtained by the radical operation of Jonnesco, interrupting both sensory and motor fibers with relief in 62.9 per cent and improvement in 18.5 per cent. Simple extirpation of the superior cervical ganglion resulted in relief in 34.4 per cent and improvement in 38 per cent.

Surgery upon the cervical sympathetic chain is usually followed by certain disagreeable after-effects. This includes enophthalmos, myosis, ptosis of the lid, and absence of flushing or sweating on the operated side. (Horner's syndrome). Also sensory disturbances may follow for a variable period, such as burning sensations and hyperesthesia of the face, neck and upper chest.

More recently the blocking of the pain impulses from the heart has been attempted by a less radical procedure, the injection of the dorsal root ganglia. This was first carried out by Mandl,[32] who injected novocaine paravertebrally with excellent results in sixteen cases. Swetlow[33] in this country has published several reports and describes his technic in detail. He uses 85 per cent alcohol, injecting paravertebrally the upper five to eight dorsal ganglia with much success in the relief of the precordial pain. In most cases there is some benefit, and in many the pain entirely disappears. This method requires some experience in nerve injection and a knowledge of the anatomy. An improper injection yields no benefit and may injure the pleura, or spinal cord, causing a serious reaction. Certain disagreeable after-effects may follow the paravertebral injection procedure, usually lasting but a few days, but occasionally for weeks. These consist of burning sensations, paresthesias, and hyperesthesia of various parts of the chest. Richardson and White[34] compared the results of cervical sympathectomy with those of paravertebral alcohol injections and conclude that the injection method is superior. Since the injections were first attempted by these observers, the results have been so favorable that the operative methods have been discontinued.

It must be emphasized that these methods of treatment are purely symptomatic. There is no attempt to cure or relieve the underlying pathology unless it be the questionable vaso-dilatation of the coronary arteries which may follow the extirpation of the motor fibers in the superior cervical ganglion. It is clear from a review of the reported cases that life is not prolonged and that the tendency to sudden death is not avoided. It certainly may be argued that suppressing the pain removes a warning signal, a valuable indication to the patient that the heart has been overburdened. Mackenzie[35] strenuously criticizes the surgical treatment for this reason. He points out that many patients learn to recognize the significance of the pain and the circumstances that provoke it and by avoiding these circumstances can often lead useful lives free from distress for many years. This justifiable criticism deserves serious consideration. It must be remembered that the trouble does not lie in the pain, but in the underlying pathological condition. The surgical and injection methods should be reserved only as a last therapeutic resort to patients suffering from intense, incapacitating anginal pain which does not yield to simple measures. Such cases occasionally are encountered and the injection in capable hands is distinctly indicated. The writer, in an analysis of fifty-five patients with anginal pain, found but one case that appeared suitable for this type of treatment. It is clear that the radical measures are rarely necessary, as most patients remain reasonably comfortable, employing the simpler methods of treatment.

Radiation therapy is frequently mentioned as a treatment, especially in the French literature. Thus far the duration of observation of the treated cases has been insufficient to justify any conclusions as to the value of this method. The basis of this method is that the posterior ganglia might be influenced by radiation much the same as by the injection of alcohol. Sussman[36] in this country demonstrated in animals vacuolization of the cells and edema in the sympathetic ganglia after irradiation. He reports favorable results in sixteen cases but states that the period of observation has not been sufficiently long to warrant definite conclusions.

Diathermia has also been attempted on the theory that an increased temperature might induce dilatation of the coronary system. Brown, Alt and Levine[37] in animal experiments concluded that appreciable changes within the chest could be obtained only when such intense diathermic currents were employed that serious burns and sloughing of the tissues were likely to occur.

SUMMARY

1. There are two distinct clinical pictures associated with coronary disease: (1) the anginal syndrome consisting of attacks of pain or acute dyspnea; and (2) the manifestations of congestive heart failure.

2. Coronary disease with congestive heart failure is usually associated with hypertension and presents practically the same problems in diagnosis and treatment as congestive failure from other causes.

3. The diagnosis of the anginal type is frequently very difficult as the clinical picture may be atypical and variable.

4. The diagnostic features of the anginal type are enumerated and discussed and an evaluation made of the various diagnostic criteria.

5. Significant physical signs are usually absent.

6. The electrocardiogram is of great aid in diagnosis, and shows some abnormality in about 70 per cent of the cases.

7. There are two chief indications in treatment: (1) the treatment of the attack; and (2) therapy directed toward the underlying pathology and the prevention of attacks.

8. The anginal pain is most favorably treated by the sublingual administration of hypodermic tablets of nitroglycerin in sufficient dosage. The disadvantages of other nitrites are discussed.

9. Paroxysmal dyspnea reacts less favorably to nitroglycerin and usually requires morphine. Many cases respond satisfactorily to ephedrin.

10. The therapy aiming at the prevention of attacks includes: (1) the readjustment of the patient's activities and habits; (2) the use of coronary dilating drugs; and (3) surgical methods for interrupting the sensory impulses from the heart. These therapeutic methods are discussed in detail.

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THE REMOTE EFFECTS OF HEAD INJURY*

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IN A recent article, "The Neurological Aspect of Head Injury," published in Minnesota Medicine for June, 1931, we discussed, in a general way, the neurological phases of head injury, especially those which manifest themselves at the time of injury and immediately afterward. It is now our desire to proceed further and discuss the remote effects of head injury, from the neurological standpoint, particularly those effects which may appear to be permanent and which from a compensable point of view have such an important bearing upon the opinion which the physician is to give in Court or before the Industrial Commission. With the ever-increasing number of head injuries, industrial and otherwise, it is important for every medical man to be familiar with the accepted status of the various disabilities which are claimed as a result of head injuries. The purpose of this presentation is to review the various remote effects of head injury, and to present briefly their "present-day" status. By remote effects we mean those which persist for a period of longer than three months after the injury, or which make their initial appearance more than three months after the injury is received.

First of all it is proper to enumerate all of the possible remote effects which may be concerned with the disability of the injured individual, and with respect to which the questions of permanency and disability may arise. They are as follows: (1) mental impairment or mental derangement; (2) epilepsy; (3) cranial nerve injuries; (4) paralyses; (5) functional nervous disorders of various kinds.

Each of these occupies its own place in relation to head injury, and the most intelligent discussion can be arranged, therefore, by taking them up one at a time.

Mental Impairment or Mental Derangement.—Insanity following head injury and due exclusively to the injury itself is comparatively rare, even in cases where there has been severe skull and brain injury. While the so-called "traumatic psychosis" is a definite entity, its existence means that there must be structural injury to the brain, either by laceration, contusion or hemorrhage, or by depressed skull fracture. It implies, also, a certain sequence of symptoms and cannot be accepted as a diagnosis if there is a long interval between the time of injury and the onset of the mental symptoms. Adolph Meyer, in 1904, presented the original conception of traumatic insanity, and, peculiarly enough, his original conception has remained almost unchanged up to the present time. The typical case of insanity, due solely to head injury, must conform to the following sequence of events: A severe head or brain injury followed by unconsciousness or delirium, recovery later with grave defect symptoms, with marked changes in behavior, with sullenness, irritability, increased susceptibility to alcohol, dizziness or vertigo, and a psychosis which usually becomes progressively worse. There must be direct continuity in its development, with no intervening period during which the individual is normal. This is the only situation in which insanity may be correctly attributed to head injury alone. Mental derangement may follow head injuries and even injuries to other parts of the body, but in the absence of structural damage to the brain or in non-cranial injuries, the trauma cannot be construed as the entire cause of the insanity. It must be viewed as a contributing factor in a predisposed individual. Here, again, there must be direct continuity established between the time of the injury and the onset of mental symptoms. It is well recognized, at the present time, that if insanity is to be attributed to trauma, either as a sole cause or as a contributing factor, there must be shown direct continuity and sequence of symptoms from the time the injury is received up to the time the mental symptoms first appear, and that if there is a period of more than thirty to ninety days after the injury, with no mental symptoms, then it is extremely unlikely that the injury is a causative factor.

Head trauma may supply the emotional factor which precipitates a manic-depressive psychosis in a person predisposed to it. Likewise, it may be a contributing factor in lighting up a dementia precox, which was present, but latent, before the injury. However, neither of these must be confused with traumatic insanity. Here, again, must be established direct continuity and sequence between the injury and onset of symptoms, with no appreciable period of normal recovery between the two. It is definitely recognized that head injury plays a part in the development of dementia paralytica, presumably by increasing the permeability of the cerebral vessels to the spirochete and the luetic virus, thereby causing a latent syphilis to become active and cerebrally localized. Here, as in other insanities, the time relationship is most important, and each case must be evaluated through study of the history of the mental condition prior to the injury, and the length of time, after injury, before mental symptoms appeared.

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In dementia paralytica, if mental symptoms appear immediately following head trauma, then no just claim of causation can be made for the injury, because the organic and structural changes of dementia paralytica cannot develop rapidly. An interval at least of several months is necessary for these to occur, subsequent to the injury, and yet this interval must not be too long. There is difference of opinion as to the length of this period, but its limits are accepted, usually, as from six months to two years. In other words, if the symptoms of dementia paralytica appear within six months following the injury, or later than twenty-four months after the injury, then the injury itself is not a causative factor in the development of the disease.

In all cases of insanity, supposedly caused by injury, one must obtain, from reliable sources, a most careful background of family and personal history, development of personality, and presence of peculiar characteristics in the individual during his lifetime prior to the injury. Honest and well-meaning persons will often make very definite statements that the individual was perfectly well prior to the injury, when as a matter of fact he was actually psychotic or nearly so. It is a persistent and erroneous belief among people that insanity is often caused by a blow on the head, even years before the onset of the psychosis, and they invariably try to connect some trivial bump on the head with the evolution of a mental disorder. Actually, however, statistics prove that only a fractional part of one per cent of insanity cases in institutions is associated with trauma as a causative factor.

Mental deficiency or feeble-mindedness, following head injury, is almost unknown. It cannot occur unless there has been severe structural brain injury. It is very common for feeble-mindedness to be claimed in children who have had head injuries of one kind or another, but careful checking up of the child's history, before the injury, will usually prove that if feeble-mindedness is present it was congenital. Any claim of parents or attorneys that a child who has sustained a head injury is feeble-minded as a result of it, should instantly rouse suspicion in the mind of the physician, and he should investigate very carefully before expressing his opinion.

Epilepsy.—In the case of epilepsy following head injury, as with insanity, the medical man must use extreme care in arriving at a conclusion, for here, again, the public is prone to furnish information which is not fact. In the first place, very few head injuries result in epilepsy. A most careful history of the individual and his family should be obtained, and in the greater percentage of cases, especially in those where there has been no structural brain injury or skull fracture, it will be proven that if epilepsy really exists, it was there before the injury. This is especially true in epilepsy of the idiopathic form. If the Jacksonian type of seizures occur, that is evidence of focal brain irritation and is much more likely to be traumatic in origin. Frequently, in severe head injury, epileptiform spells will occur soon after the injury—possibly in a few moments or a few hours. In these cases, it is usually due to sudden brain irritation, caused by edema or hemorrhage, and disappears promptly with the subsiding of the edema or absorption of the hemorrhage. If due to depressed skull fracture, operative interference will relieve the attacks. These spells occurring soon after injury cause less anxiety than those appearing some months later, due to scar formation, cysts or other secondary changes in brain structure. It must be borne in mind that the emotional reaction from an head injury may light up an old epilepsy which had been quiescent for a long time. If this occurs, it must be conceded that the injury was contributory in cause, as it aggravated a preëxisting condition. It is difficult to give an accurate "elimination period" for epilepsy which follows head injury. It is, however, generally conceded, that if spells begin later than one year after the injury, the epilepsy is not due to trauma, unless some focal brain injury can be demonstrated.

In the *London Lancet,* for October 27, 1928, W. W. Wagstaffe, writing on "The Incidence of Traumatic Epilepsy after Gunshot Wound of the Head," arrives at the following interesting conclusions, after analysis of three hundred and forty post-war patients who were still alive:

1. Traumatic epilepsy is nearly ten times more common in penetrating wounds of the dura than in other head injuries.
2. The site of the wound has no influence on the onset of traumatic epilepsy.
3. Traumatic epilepsy is more than twice as common in cases of penetrating wounds of the dura which show severe organic lesions, than in those which do not.
4. Traumatic epilepsy may come on at almost any time after a gunshot wound of the head. (In his series the variation was from two months to seven and one-half years.)
5. Traumatic epilepsy appears to be much more common in those patients who show transient Jacksonian fits within a few days of the injury.
6. Traumatic epilepsy is somewhat more common where a metallic fragment has remained in the brain.
7. The mortality in those who develop traumatic epilepsy is rather higher than in other cases of gunshot wounds of the head.

In the same article, he quotes P. Sargent as finding four and one-half per cent of epileptics in an analysis of eighteen thousand cases of gunshot wounds of the head.

Cranial Nerve Injuries.—In cranial nerve injuries following head trauma, the nerves most commonly affected are the first, third, sixth, seventh and eighth. These injuries manifest themselves in the so-called cranial nerve palsies, and produce paralyses or derangement of function in the organs supplied by the nerves. Loss of sense of smell, interference with the motor-oculi group, facial paralysis, and impairment or loss of sense of hearing are very common, particularly following basal skull fracture. There can be no mistake in diagnosis in cases where cranial nerve palsies are concerned, for they are always clear-cut and well-defined, and occur reasonably soon after the injury is sustained—usually within forty-eight to seventy-two hours.

Paralyses.—Paralysis which follows head injury may be organic or functional in causation. If organic, it is the result of structural brain injury, either as a result of laceration, contusion, hemorrhage or depressed skull fracture. The paralysis appears in that portion of the body whose motor control lies in the injured brain area. We may have hemiplegia or monoplegia, complete or incomplete, with or without facial involvement, and with or without sensory involvement, depending upon the location and extent of the brain injury. Paralysis may be temporary or permanent, depending, also, upon the degree of brain injury. If functional, the paralysis is that which is ordinarily considered hysterical, and is the result of psychic trauma, and not physical or structural injury. Here, again, we may have partial or complete paralysis involving one or more groups of muscles, but in this type of paralysis the degree of disability does not depend upon the severity of the injury. Psychic trauma may occur as the result of a very slight injury, where the power of suggestion is strong enough to produce in the individual the conversion of an idea into a physical manifestation. Such paralysis is very common, particularly in cases where compensation or litigation is involved.

Functional nervous disorders of various kinds.—Functional nervous disorders following head injury presents, by far, the biggest problem to the physician who concerns himself with examination and evaluation of head injuries. Here we have an intricate mass of subjective symptoms not substantiated by objective findings. There are so many types of disorders in this group that it is not possible to discuss them singly at this time. These are the patients who have reacted emotionally to injuries which in themselves are often very trivial and which are not concerned in any way with evidences of organic injury to the brain or central nervous system. The emotional side is so disordered that fear and horror are aroused and prolonged long after the injury itself has ceased to have a prominent place in consciousness. Here we have the normal personality replaced, at least to some extent, by intricate abnormal psychological patterns, and there is more or less suppression of normal self-confidence and normal will power. Fear and anxiety are frequently powerful enough to produce actual constitutional changes in the individual. He lives over and over again the experiences of his injury, and his resultant emotional reactions are often associated with and augmented by those mal-adaptations of his ordinary life, which had never before been oppressive, but which now appear to be tremendously exaggerated. In persons who have an adequate and well-balanced personality, these reactions, if aroused, do not last for any great length of itme. They do, however, in many cases, result in so much anxiety that a change of occupation or of occupational environment is necessary to bring about a return of normal adjustment.

Head injury carries with it powerful suggestion of fear, and following such injury we are apt to have a more severe actual neurosis than that which occurs after injury to any other portion of the body. The true traumatic neurosis may constitute a very real disability, and must not be confused with the compensation or litigation neurosis, or malingering. Traumatic neuroses may vary greatly in their symptoms and severity. They are characterized and engendered by fear and anxiety, which centers upon the individual himself, concerning both his present condition and his future welfare. In the compensation or litigation neurosis, anxiety is directed particularly toward the question of how much is to be paid for the injury, or fear over having to appear in court. In the malingerer, there is willful pretense, for purposes of securing financial gain. Upon the physician falls the burden of distinguishing between these three conditions, and of determining the amount and duration of disability. In judging such individuals, there are important things to be considered. Ability to sleep, condition of body weight, ability to concentrate mentally, and general emotional stability are very important, but most important is the study of the individual himself, and the analysis of his attitude, of his motive, and of his sincerity. The true traumatic neurosis presents often very frank constitutional symptoms. The litigation neurosis and the malingerer never show these. This mammoth group of cases deserves attention, which, for lack of time, cannot be given in this presentation. They constitute the greatest problem in industrial medicine today, both to carriers of insurance, to employers and to medical men.

In conclusion, a brief discussion of permanency in remote effects of head injury is pertinent. Actual traumatic insanity is, in most cases, permanent. Arising as it does from structural brain injury, there is small chance of a return of normal mental capacity. The same may be said of mental deficiency or mental impairment arising as a result of brain injury. If the space of one year passes with no improvement in the psychosis, it can be said to be permanent. The same is true of manic-depressive insanity or dementia precox, in which the trauma has played a causative part. The prognosis in manic-depressive insanity or dementia precox, caused partially by the emotional reaction of head injury, is just the same as it would be in manic-depressive insanity or dementia precox which develops spontaneously and without head injury. In the former, sixty to seventy per cent recover; in the latter, a twenty to thirty per cent recovery may be expected. If, however, the psychosis is prolonged for one year following the injury which was concerned in its production, then one may reasonably expect permanency.

In epilepsy which arises after head injury, assuming that it is due to the head injury, we may expect permanency if the spells continue from twelve to eighteen months after the injury is received. Within that period, there is a reasonable possibility of recovery from the structural injury causing the spells and cessation of the spells.

Cranial nerve palsies and peripheral paralyses persisting for more than six months after the injury are in all probability permanent. The average cranial nerve palsy or peripheral paralysis of organic causation, which is going to recover, will do so within two to six months after the injury is received. Suspicion of permanency is justifiable after six months, and certainty of permanency is justifiable after one year has elapsed.

In the functional group of cases following head injury, we rarely find permanency. In all these cases, settlement of claims for damages and clearing up of litigation is very important, and should always be advised at the earliest possible moment. In the true traumatic neurosis, recovery will not occur as rapidly as in the compensation or litigation type. In the ordinary head trauma, where there has been no skull fracture or organic brain injury, one may expect a reasonably rapid recovery after questions of litigation and compensation have been settled. Three months' time is usually sufficient for an individual to return to duty, in this type of case. In the simple skull fracture, without depression of fragments or brain injury, from three to six months is usually required for the individual to readjust himself. In cases where a severe traumatic neurosis arises, which is characterized by substantial loss in weight, profound insomnia, definite depression, and inability to concentrate mentally, we may have disability ranging up to eighteen months following the injury. It would be most unusual for such cases to be permanent.

In head trauma, where there has been skull fracture, with displacement of fragments, and where there has been contusion, laceration, or hemorrhage, affecting the brain or its coverings, we may have all degrees of disability, ranging from partial and incomplete disability for a number of months, with recovery, to complete and permanent disability—the result of organic changes in the brain. It is in cases of this type that particular skill is required in summing up the individual's condition and arriving at an accurate conclusion as to what may be expected in his future.

One difficulty very frequently encountered by the physician, in his attempt to rehabilitate the functional nervous case following head trauma, is the impossibility of securing some light form of work for the patient. Many cases, receiving comparatively minor head injury, are so overcome with fear as a result of the circumstances which surrounded their injury, that for a time they are unable to command themselves sufficiently well to return to their normal occupation. This is true, particularly, in individuals who work in high places, such as structural steel workers. In these cases, rehabilitation may often be accomplished if the individual can be given some light form of work, where he can reëducate himself and set aside the fear which has possessed him. It is very difficult to secure coöperation from employers, who cannot understand why a man who looks physically strong should be unable to resume his former occupation in the air.

Time does not permit further discussion of this intensely interesting subject, which is so pertinent to physician, insurer and employer today. It behooves every medical man who is concerned in this type of practice to give attention and study to this group of cases, in order that justice be meted out to all concerned.

1068 LOWRY MEDICAL ARTS BUILDING.

TUBERCULOSIS IN A RURAL COMMUNITY*

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THERE are 1,400 organizations throughout the United States, the primary object of which is the eradication of tuberculous disease. The mortality rate of tuberculosis has decreased from 202 per 100,000 population in 1900 to 97 per 100,000 in 1922. This achievement has been possible only through the constant energetic work of these anti-tuberculosis societies and of individuals primarily interested in the disease. Thus far, their efforts have been concentrated upon cities and their environs. Rural communities have received some attention; yet the interest and active coöperation of country practitioners have not been enlisted fully.

Perhaps the greatest good that a paper such as this might accomplish is to demonstrate that any country community presents a fruitful field in which to continue the campaign against tuberculosis. If this is shown, and if thereby the interest and coöperation of rural practitioners are aroused, then a course of procedure available to the country doctor for the diagnosis of early as well as advanced cases of pulmonary tuberculosis must be outlined. It is hoped that the narration of events experienced in the attempted control of the disease in the farm region centering around the village of Swanville, Morrison County, may help to accomplish either or both of these ends.

During the summer and fall of 1929, first whooping cough and then measles reached the proportions of mild epidemics. Both of these diseases predispose to tuberculous infection, and their occurrence gave a warning that an increased incidence of tuberculosis might be expected. In December, a high school girl died of tuberculous meningitis. Several months later a high school graduate of the previous year was found to have moderately advanced pulmonary tuberculosis. In June, 1930, a three year old girl died of tuberculous meningitis; and shortly after her death a third high school girl was found afflicted with a pulmonary lesion.

Three of these patients had had either measles or pertussis during the year preceding the diagnosis of tuberculosis. Two of the three high school students had had productive coughs, and tubercle bacilli were demonstrated in their sputa. Two of them lived on farms from which cream was sent to the local creamery. Two delivered milk to customers of the village milk route.

These facts definitely indicated a greater incidence of the disease than had previously been suspected and suggested rigorous vigilance for the detection of other cases. It appeared necessary, immediately, first, to arrange a course of procedure for the certain detection of new cases, and, second, to adopt an epidemiological approach to the problem from every possible angle.

The definite routine set up to detect new cases is adjustable to any rural practice and is thorough enough to avoid failure of recognition of the disease, whatever the type or mode of onset. A detailed history is taken and a careful physical examination performed. When these two procedures arouse suspicion, the patient is asked to keep a daily temperature record with readings recorded every four hours, and is taught how to do it. Any rise above 99° F. in a male patient or 99.6° F. in a female one, or any variation of more than 1.5 degrees during the day, is considered, if persistent, corroborative evidence. Repeated sputum examinations are made. The von Pirquet tuberculin test is used as a routine, but where it leaves any doubt the Mantoux test is applied. All atypical childhood or adult cases of pneumonia are subjected to tuberculin tests. Whenever these tests show a positive reaction, X-ray plates of the chest are taken and are submitted to some recognized roentgenologist for interpretation. Basal metabolism tests are made and repeated as necessary. Tuberculosis is diagnosed only after the postulates of the National Tuberculosis Association are fulfilled. Each diagnosis made is confirmed by consultation.

Besides proving the diagnosis in the four cases already cited, this schedule led to the discovery of seven other cases: two of far-advanced adult apical lesions, one moderately advanced adult case, two basilar lesions (one with an acute and one with an insidious onset), one early infiltrative lesion in an adult, and one infiltrative lesion with an acute onset in a four-year-old child. Two of these cases presented some obscurity and diagnostic difficulty, and the diagnosis was not considered definitely established until confirmed by consultation.

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These diagnostic procedures provided adequately for the discovery of new cases in practice, but the epidemiological features of the disease became more prominent with each new case. Partial postmortem examination in the first case mentioned revealed a far advanced lesion in the left upper lobe. There were six other children in this family, and the father and mother had been in poor health for months. The whole family had lived for years on a farm, and three years prior to their moving into the village one cow of their dairy herd had died of tuberculosis. Later, three other cows in this herd were found to be infected. Two of the children had had measles and two had had pertussis within six months of the death of their oldest sister. Also, it was known that the girl assisted in the delivery of the village milk supply.

The father was sent to the University Hospital, where it was determined that he was suffering from incipient bilateral tuberculosis. Von Pirquet tests, roentgenograms and continued observation demonstrated tuberculous lesions in three of the remaining children. In this way, from the discovery of five cases in one household, it became apparent that the entire family of each case must be studied, and this action was the first step in epidemiological control.

Skin tests followed by X-ray plates of those individuals with positive reactions failed to reveal, in the second case mentioned, any tuberculous disease or infection in the immediate family of the patient. However, two cases of the childhood type and one early adult lesion were found in the family of the sister of this patient. In each of the third and fourth cases cited and in another one subsequently observed a second member of the family was found affected. Thus, ten cases spread by family contact were demonstrated simply through cutaneous tuberculin tests, X-ray study, and observation.

Two individuals with active pulmonary tuberculosis were known at one time to be delivering milk on the village route. Substitutes were found for these workers. Also, to avoid continued dissemination in this way, it was necessary to see that all cows from which milk was supplied to the village be tested and proved free from tuberculosis. Although two of them had been tuberculosis suspects two years before, testing of all the cows giving milk distributed in the town failed to show any positive reactors. One herd was tested twice within eight months to be doubly sure. As a safeguard for the future, the council adopted a resolution requiring annual testing of all cows giving milk for human consumption within the village.

In one family a possible relationship between bovine and human tuberculosis was indicated. Two of the cases mentioned were in farm families owning dairy cattle. So it seemed advisable to have all the cows owned by every family in which one or more members had the disease tested. This was done to ascertain further any possible relationship between human and bovine tuberculosis, as well as to avoid the possibility of continued dissemination through delivery of contaminated cream to the local creamery. One infected cow was found in the herd of a family in which were two cases of the childhood and one of the adult type. These three individuals, however, were related to and had associated with one previously mentioned suffering from active disease; so it was not considered that close inter-relationship between human and bovine tuberculosis had been demonstrated.

The answer to the creamery problem was arrived at, first, through an Area Test instituted by the county commissioners of Morrison County, and, secondly, through inquiries concerning pasteurization and distribution of creamery products. In August, 1930, 35 accredited veterinarians and two state and federal veterinarians, under the supervision of the State Livestock Sanitary Board, tested all cows in the county. They obtained these results:

Total number of cattle tested	54,493
Total number of herds tested	3,453
Total number of infected herds and suspects	192
Percentage of herds infected	5.5
Total number of negative cows in infected herds	3,589
Total number of reactors	572
Total number of suspects	33
Total number of cows under feeder-quarantine	45
Percentage of infection found in the county	1.05

Retesting of suspects and cows under feeder-quarantine slightly increased the number of reactors and the percentage of infection. Seventeen cows in Morrison County and one in Todd County, adjoining, supplying cream to the local creamery were found to be infected. All these animals were disposed of, so it could be concluded that the cream supply was not infective. It still remained possible that, during the time that cream from these infected cows had been delivered to the creamery, this institution had spread the disease unwittingly, milk, cream, butter, buttermilk and cheese having been sold there. But all of these products had been pasteurized, so it was not felt that the creamery could be considered a focus of dissemination.

In another way, also, the Area Test seemed to affect the problem. It was thought that tests of all members of the families of owners of cattle found tuberculous, might disclose more cases of human tuberculosis which were possibly dependent upon the bovine type. Three of the cases already described were in the family of an owner of one tuberculous cow. Two cases were found in which the family milk supply was partially obtained from two cows which had been tuberculosis suspects two years previously. Three families with tuberculous cattle refused to be tested. The other four families owning tuberculous cattle were tested and showed two positive reactors, but X-ray examinations proved tuberculous lesions absent in these individuals. It is hoped that the families of the owners of tuberculous cattle in more distant parts of the county will be tested and examined in the near future.

One month after the cattle test was completed, the health authorities of Little Falls suggested a plan whereby all high school students in the county could have the Mantoux test applied, if their parents wished it. The Morrison County Medical Society sanctioned the plan, and Dr. E. A. Leggett of Minneapolis did the work. Though there were 948 high school students in the county, only 608 tests were applied, and a few of these subjects were grade school students. Dr. Leggett has been kind enough to permit the use here of the results of her work, which are as follows:

Total number tested	608
Total number under 10 years of age tested	29
Total number over 10 years of age tested	579
Those reacting positively to 0.1 mg. of O. T.	58
Those reacting positively to 1.0 mg. of O. T.	62
Total positive reactors under 10 years of age	0
Total positive reactors over 10 years of age	120
Highest percentage positive reactors in any group	29
Lowest percentage positive reactors in any group	5.7
Percentage of reactors in entire group	19.7

Of the 608 tests applied, 120 (19.7 per cent) showed a positive reaction. Only 118 of these suspects permitted X-ray study. Interpretation of the plates by Dr. J. A. Myers, president of the Minnesota Public Health Association, and Dr. H. A. Burns, superintendent of the State Tuberculosis Sanatorium, revealed tuberculous lesions in fifty-nine cases. Of these fifty-nine, thirty-four showed frank, unquestioned lesions, while in twenty-five the status of the lesion was somewhat doubtful. In the clinic which followed the tests and X-ray work, forty-nine cases were found with demonstrable lesions, or else were sufficiently suspicious to require further observation. Even if the latter figure is considered as the correct number of cases—and from every point of view this is the most conservative figure tenable—the work proves an incidence of tuberculosis of 8 per cent. It should be borne in mind that all of these were persons who had been believed to be well and healthy. All of them had become infected from some unknown source and each of them was or could be a potential focus of dissemination.

The work done by Dr. Leggett embraced insofar as possible only the high schools of the county. Nine of the cases found in practice had attended either the local high school or the grade school. Other cases in the series were from small surrounding villages; so, as an extension of Dr. Leggett's work, it was decided to apply the Mantoux test on as many as possible of the grade school pupils in the four neighboring communities of Swanville. After the proposed program was sanctioned by one of the state health organizations, cards were sent to the parents, requesting their permission to perform the test.

As a result, 264 Mantoux tests were applied. Of these children, thirty-nine showed positive reactions. X-ray plates were taken of the chests of twenty-eight of these reactors, and the plates were interpreted by Dr. Malcolm Hanson of the Roentgenology Department of the Lymanhurst School for Tuberculous Children. Thus, tuberculous lesions were shown in two cases, indicating an incidence of infection of 0.75 per cent of all tested, or 7.14 per cent of those reacting positively who had X-rays taken.

In addition to these tests, thirty-three von Pirquet tests were applied in routine practice. Including fifteen other cases of tuberculosis with positive von Pirquet tests, a total of forty-eight von Pirquet tests has been performed. Among these, thirty-four were positive, and seventeen of the positive subjects disclosed tuberculous lesions in the roentgenograms. These cases would naturally show a high percentage of infection, for in most instances they presented some of the cardinal symptoms of the disease.

It has been difficult to investigate the entire families of each of the students who, through the diagnostic campaigns described, were found to have tuberculous infections. Undoubtedly such a procedure would disclose more cases and would prevent further spread of the disease. This would be the last step in the study of the epidemiology of tuberculosis in Morrison County, though it is not the last work which should be done for the detection of the disease.

A summary of the work shows a total of twenty-three cases of pulmonary tuberculosis encountered in 18 months of rural practice. Seven cases were found to follow measles, and two following pertussis. Of the twenty-three cases, twelve were of the adult type, nine of the childhood type and two showed both kinds of lesions. Eleven of them were identified through adherence to a definite diagnostic schedule. Twelve were found by investigating the epidemiologic aspect of the cases found in routine practice. Eight cases were found in which the milk supply was obtained from tuberculous cattle; and two, with a milk supply from cows considered tuberculosis suspects. Twelve cases had tuberculous associates. Two hundred and sixty-four Mantoux tests were performed on grade school children, showing thirty-nine positive reactors and two cases with lesions demonstrable by X-ray. Forty-eight von Pirquet tests were performed, showing thirty-four positive reactors and seventeen cases with demonstrable lesions.

The following conclusions might be drawn:

1. As demonstrated by the facts that twenty-three cases of pulmonary tuberculosis were found in a limited rural practice within 18 months, that through the tuberculin testing of 608 high school students in one county, at least forty-nine individuals previously believed to be healthy were found to have tuberculous lesions, rural districts are promising fields for the continued fight against tuberculosis and its still excessive mortality rate.

2. If the first conclusion can be considered of any significance, every available means must be used to stimulate the interest and coöperation of rural practitioners in the fight against the disease. For the accomplishment of this objective, one of the most effective methods is the frequent repetition of a routine schedule for diagnosis available to every country practitioner and thorough enough to prove unfailingly every case of tuberculosis encountered.

The results to date of this attempt to control the disease in Morrison County could not have been obtained without the generous coöperation of Dr. Myers, Dr. Burns, Dr. Hanson and Dr. Leggett. I should like to express my appreciation to them, and to Dr. Herman Hilleboe and Dr. John Simons, for their kind assistance.

VARICOSE VEINS: SOME SPECIAL CONSIDERATIONS IN TREATMENT

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DURING the past two years, while assisting the American Medical Association Committee on Varicose Veins in conducting their clinics at the convention sessions, certain questions were repeatedly asked me by the attending physicians. In the order of their frequency, they were as follows: (1) What is the best solution to use? (2) What is the best technic? (3) How do you treat ulcers? (4) What is the best method of handling sloughs? (5) Should pregnant women be given injections? These same questions have also been most frequently encountered in conducting local clinics, especially during the past year. It is the purpose of this paper to answer these questions as accurately and completely as possible.

1. *What is the best solution to use?* This question has become more difficult to answer each year because new solutions are constantly appearing on the market which are claimed to remedy the faults of the old ones.

Bichloride of mercury, first used by Linser[1] to obliterate veins, is little used now because of its toxicity and the severe sloughing produced if some is accidentally injected outside the vein. Only one injection can be given at a visit and the small amount injected (1 c.c. of a 1 per cent solution being the maximum dose) results in only slight sclerosis, so that many injections and visits to the office are required. The same objections apply to red iodide of mercury, mercury cyanide and metaphen (the latter, however, can be safely given in doses up to 8 c.c., according to Schussler[2]).

Sodium chloride and sodium salicylate, in 20 to 40 per cent solution, were used in Europe for years, the former by Linser[3] and the latter by Sicard[4] and Forestier in Paris. Although they are still used routinely in this country in certain charity clinics, chiefly because of their low cost, most physicians have discarded them in their private practice as they produce severe pain immediately following injection, severe sloughing if injected outside a vein, and frequent "perivenitis."[5] Also, an occasional individual has an idiosyncrasy to salicylates. I use them only in "intima resistant"[6] cases and in recurrences.

Sugar solutions have been used since 1923 in the forms of glucose and invert sugar. They cause little or no pain, are non-toxic and result only in a painful, indurated area *without sloughing* if injected *outside* of a vein. Invert sugar solutions were preferred by Nobl[7] because of their decreased viscosity compared with glucose, allowing them to be easily injected in strengths of 60 and 70 per cent through a 20 gage needle.

During the past year or two, combinations of sugar solutions with sodium chloride or sodium salicylate have become very popular. The salts increase the irritant action on the intima, resulting in a firmer and higher percentage of sclerosis. The "edge" of the painful cramp is "taken off" by the addition of 1 per cent phenyl carbinol or some similar local anesthetic.

Quinine-urethane solution in 2 to 4 c.c. dosage has been advocated by Genevrier and Douthwaite[8] of England, and has been tried by many men in this country. Its chief objections are its *toxicity* frequently causing severe general reactions, *sloughing* if injected outside the vein, and its *small* maximum *dose.*

In order to determine the merits and faults of the most popular solutions, I made a careful study of their action in the same and different cases, giving at least 200 injections with each solution in some 600 different patients. The various angles studied, with the results obtained, are given in Chart 1.

Although a carefully standardized technic was used, developed after experience with more than 15,000 injections, failure to obtain a sclerosis occasionally resulted with all of the solutions. Several times with each preparation, where some solution was accidentally injected perivascularly, dilution with normal saline was omitted in order to see if a slough would appear. Unfortunately it did appear with all solutions except plain invert sugar, mercuric chloride proving the most toxic and causing a slough in two instances even after being well diluted with normal saline.

The combination of invert sugar (60 per cent) and sodium salicylate (15 per cent) seemed to be the most effective except for a rather high percentage of resulting perivenitis and a very occasional idiosyncrasy.

The combination of invert sugar and sodium chloride with some substance such as phenyl carbinol added to act as a local anesthetic and to prevent some of the usual pain, was almost as effective in producing firm sclerosis, and had a lower percentage of perivenitis.

Quinine-urethane is altogether too toxic to be used routinely. In addition to nine severe reactions and many mild ones, I had one patient who almost died after a 2 c.c. injection. Within thirty seconds after the solution entered the vein, she began to have labored respirations, cyanosis, drop in blood pressure, weak, rapid pulse, and finally delirium which was severe for six hours and did not entirely disappear for twenty-four hours. The patient had to be removed from my office to the hospital in an ambulance, where she had to remain for two days. She said she did not feel herself again for two weeks. One should always be on the lookout for these sensitive patients and never give more than 0.5 c.c. the first time and increase by only 0.5 c.c. up to 2 c.c. at a sitting.

The use of invert sugar alone seems to be limited to small veins, as failure of closure was comparatively high in the larger veins. It is an ideal solution to use here, however.

Mercuric chloride is quite toxic both systemically and locally and should be used only in patients with idiosyncrasy to salicylates and quinine-urethane, and where sugar solutions alone or in combination cause severe cramps. One must also be sure the kidneys are normal before using this mercurial.

It is difficult to select a solution that can be satisfactorily used in all cases. I have concluded from my own experience and that of some others, that the best solution to use routinely is a combination of invert sugar with sodium chloride or sodium salicylate, preferably the former. The ones I use and prefer are varichlorose and invertose compound. They can be used safely in all sizes and types of veins with a high percentage of closures if careful technic is observed. It is non-toxic, so that comparatively large amounts can be injected at one sitting (20 to 40 c.c.). If some is accidentally injected outside the vein, it

CHART 1. RESULTS OF CLINICAL EXPERIENCE WITH VARIOUS SCLEROSING SOLUTIONS

Solution	Invert Sugar† 50-70%	Invert Sugar and Sod. Sal.‡	Sodium Salicylate 20-40%	Dextrose and Sodium Chloride	Varichlorose*	Quinine-Urethane	Mercuric Chloride
Number of injections	600	600	600	200	200	400	200
Percentage of failure of sclerosis	5.3	1.5	0.5	3.5	2.3	1.2	4.2
Percentage of perivenitis	2.1	8.1	3.9	4	2.8	5.2	1.1
Number of sloughs	0	2 s	3 m	3 m	2 m	4 s	2 VS
Percentage of reactions s S	0 0	1.1 0	1.2 0	1.5 0	1 0	many 9	0.5 0
Pain	0 or s	s or m	s or m	s, m, or S	s, m or S	s or m	0
Percentage of soft clots	1	0	0	0.7	0.3	0.8	0.9
Percentage of jumped closures	1	1.5	0.5	1.5	1.2	0.5	0.5

0, none; s, slight; m, moderate; S, strong or severe; VS, very strong or severe.

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†Invertose: 50-70% indicates invert sugar content by weight.
‡Invertose Cpd: Invert sugar 60% (by weight); sodium salicylate 10% (by weight).
*Varichlorose: Invert sugar 3.5 in 10 c.c.; cane sugar 2.5%; sodium chloride 1.5 in 10 c.c.; phenyl carbinol 0.86%.
The above formulæ furnished by Ulmer Laboratories, Minneapolis, Minn.

can be easily diluted five to ten times with normal saline or the patient's blood, and thus any possibility of sloughing can be prevented. In cases of diabetes, its carbohydrate value can be allowed for in the diet. If an individual is especially subject to cramps, small amounts (2 to 5 c.c.) of the solution can be used, which will usually not produce cramps or will reduce them to a minimum. Percentage of perivenitis following its use is low, and general reactions are very rare.

For the past year I have been using this combined solution routinely with great satisfaction, having now had experience in some 5,000 injections. Occasionally I find a patient who is very sensitive to cramps and does not stand pain well, and here I try plain invert sugar (50 to 70 per cent), quinine-urethane, bichloride (0.5 per cent), or small doses (2 to 3 c.c.) of 20 per cent sodium salicylate, provided the patient has no idiosyncrasy to them. It may be best to use one of the latter solutions in diabetics also. In small veins, especially the tiny, dilated varicosities of the precapillary veins, I find that plain invert sugar solution (50 per cent) works nicely. Stronger solutions such as quinine-urethane, bichloride or sodium salicylate (20 to 40 per cent) will often produce a slough even though injected intravenously in these tiny veins.

In case of recurrences, where canalization has occurred in a previously sclerosed vein, I find the wall of the vein usually thickened and the intima more resistant than before. Stronger solutions, such as sodium chloride or sodium salicylate (20 to 40 per cent), quinine-urethane or 1 per cent bichloride must and should be used in these cases. I prefer the 20 to 40 per cent sodium salicylate solution as I have found it less painful than the sodium chloride, can be given in larger amounts than quinine-urethane or bichloride, and I have obtained a sclerosis more easily with it than with any of the others. Occasionally one runs into a very stubborn case where the intima is very resistant. Here it is necessary to use very careful technic and re-

CHART 2. TYPE AND AMOUNT OF SOLUTIONS USED FOR INJECTION*

Solution	Maximal amount at one injection—c.c.	Advantages	Disadvantages	Indications for use
1. 15-50% sodium chloride	10	Nontoxic; prompt action	Marked cramping; danger of necrosis	In large, thick veins; preferable in combination with dextrose
2. 50% dextrose	20	Nontoxic; no slough; slight cramping	Not irritating enough for larger veins	For smaller, thin walled veins
3. 30% sodium chloride and 50% dextrose, equal parts	10	Nontoxic; prompt action	Marked cramping; necrosis if large amounts are injected beside the vein	Generally useful; combines the advantage and reduces the disadvantage of solutions 1 and 2
4. 50-75% invert sugar	10 or more	Nontoxic; slight cramping; no slough	Not irritating enough for larger veins	Best for smaller thin walled veins
5. 30% sodium chloride, 60% invert sugar, 1% phenyl carbinol	10-30	Nontoxic; slight cramping	Moderate cramping; necrosis if large amounts are injected outside vein	Generally useful; best solution for routine use. Combines advantages and reduces disadvantages of solutions 1 and 2
6. 20-40% sodium salicylate	5-10	Prompt action	Painful if more than 4 c.c. injected; danger of necrosis, salicylism	Generally useful with caution, best for resistant varices
7. 10% quinine with urethane	2	Prompt action; painless	Cinchonism; *anaphylactoid* reactions; danger of necrosis	Resistant varices; test for individual susceptibility
8. Sodium morrhuate	1	Nontoxic; rapid action, slight danger of slough	Marked cramping; and periphlebitis	Resistant varices; when quinine cannot be used

*After outline of A. M. A. Committee on Varicose Veins.

inject the vein every other day until sclerosis results. In one case I had to give five injections in the same vein before sclerosis was obtained.

There are some other solutions on the market which are more rarely used and not included in this study. I have listed them in Chart 2.

2. *What is the best technic?* This is a very difficult question to answer as many very good men obtain excellent results with very different technic. A physician attending the varicose vein clinic at the convention booth of the American Medical Association in Philadelphia told me that he watched five different doctors demonstrate, and all used a different technic. I told him I felt this was an advantage to him as he should be able to work out a technic for himself containing all the good points of the various demonstrations. Some men prefer to have their patients standing, others sitting, during the injection. I prefer to have my patients lying down as it makes emptying of the veins easier, and thus prevents dilution of the injecting fluid. The main thing is to get the solution in contact with the intima of the varix with the least dilution by the blood. My own technic, which I have used successfully in over 20,000 injections, is as follows: While the patient stands erect so as to distend the veins, the point of injection is selected and marked with 1 per cent mercurochrome. A rubber tourniquet is now applied well above this point. The patient then sits on a table with an adjustable leg-rest, the latter being at 45 degrees. The skin is sterilized as for any intravenous injection. A sharp sterile needle, 18 to 24 gage, according to the size of the varix, attached to a sterile glass Luer or Vim syringe filled with the solution at body temperature, is carefully inserted into the marked varix. Blood is aspirated to be sure the needle is well within the vein. The adjustable leg-rest is now raised to a horizontal position or 90 degrees. The patient carefully lies down without moving the leg. The tourniquet is now removed, relieving the distention. The assistant with index fingers now carefully "milks" the remaining blood from a section of the varix for a distance of a few centimeters above and below the needle, being careful not to disturb the latter. After assuring myself that the needle is still in the vein, I inject the solution rapidly enough to produce slight distention. I keep the index finger of my left hand over the point of the needle so I always know where it is, and can quickly feel any solution going outside the vein. The fingers of the assistant and the needle are kept in place for five minutes after the injection is completed. Upon removing the needle I apply a sterile gauze pressure pad with adhesive strips at the needle site. If the veins are large and prominent, I apply a larger non-sterile pressure pad over the section of the vein four to five inches above and below the point of injection and hold it in place with a rubber elastic bandage applied from ankle to thigh. This is kept on for two to three weeks, and removed only during the subsequent injections, which can be given bi- or tri-weekly. This allows the veins to become sclerosed in a collapsed state and produces a quicker cosmetic result. The patient is instructed to get up and go about his duties as usual in order to attain the best results.

Twenty-four to forty-eight hours after an injection one of the following results may be expected: (1) no sclerosis; (2) thickening of the vein wall without obliteration of the lumen; (3) complete sclerosis and obliteration of the vein lumen resulting in a tender fibrous cord; (4) same as (3) with perivenitis (described later). Repeated injection at the same point with stronger solutions must be made if the first two results occur.

In case of perivenitis, I suspend further injection in that leg for a few days, instructing the patient to use large, hot, wet, 25 per cent magnesium sulphate packs around that portion of the leg, as continuously as possible.

Of the various technics used, injection between the double tourniquet applied to the leg is the least desirable, to my way of thinking. Any excess of solution injected after the vein between the tourniquets is filled, is forced through the connecting into the deep veins. If large amounts are being injected by this method, there is danger of irritating the intima of the deep veins enough to cause sclerosis, especially if one should happen to be dealing with one of those cases in which the intima is hypersensitive.

In addition, I mention some general rules to follow which I have found very worth while. Large varices, especially if long, should first be injected near their lowest point and so closed from below upward. Clumps, plexuses or masses of large varices usually found over the calf of the leg are prone to develop perivenitis, so strong caustic solutions should be avoided, especially in large amounts. Sugar solutions are safest. In these plexuses an iron ring, two or three inches in diameter, may be pressed firmly around the point of puncture to keep the solution from escaping. It is hard to prophesy how a vein will sclerose, as some large veins close extensively from injections of mild solutions, while some small veins may need repeated injections of increasing concentration at the same point. It is safest to start with weak solutions.

It is safest not to give more than two injections at a sitting, that is, one in each leg. The literature shows that many of the cases of reported emboli followed where many injections were given at one sitting (Meisen[9]).

Nonsclerosis is due to poor technic, or increased resistance of the intima to the irritating effects of the sclerosing agent, an individual characteristic.

A slough may be expected in all cases where extravenous injection has occurred, except when plain sugar solutions are used. The solution in the tissues should be liberally diluted by injecting normal saline or the patient's blood, the area massaged for five or ten minutes, and a hot water bag applied for an hour or two.

The patency of the deep veins should be tested in suspicious cases by the Trendelenburg, Perthe and Pratt methods before injecting. Where the deep veins are closed, injections should never be carried out.

This form of treatment is probably inadvisable in cases of hard chronic edema or elephantiasis. These patients should be carefully studied for heart or kidney deficiency, and other vascular diseases of the extremities.

3. *How do you treat varicose ulcers?* This is certainly an appropriate and timely question, for what can be more painful and disabling than an inflamed, infected varicose ulcer? The first thing is to be sure you are dealing with a varicose ulcer, and not one due to syphilis, tuberculosis, or a mycotic infection. All varicose ulcers have varicose veins leading to them. These veins may enter from almost any side or merely run under the ulcer. They cause an abnormal circulation due to venous stasis resulting in a poorly distributed supply of oxygen to the extremity, especially the skin. Usually the reverse flow of blood in these varicosities results in an increased pressure within the veins greater than that in the arterial capillaries, as shown by Wright,[10] resulting in marked venous stagnation. This causes phlebitis, periostitis and eczema, as well as ulcers. Thrombosis, as the result of trauma or phlebitis, cuts off the circulation to an area of the skin which dies, sloughs out, and the ulcer appears. Secondary infection may now enter as an aggravating factor. It is obvious that in order to heal a varicose ulcer, *the cause*, venous stasis, must be removed. The old method was to put the patient to bed and elevate the affected limb, or remove the guilty veins by operation. This involved considerable expense, introduced an economic factor and the bed rest was not good for elderly individuals, in whom these ulcers are so common.

There are two ambulatory methods which accomplish the same result, namely, remove venous stasis. The first is injection and sclerosis of all varicose veins causing the venous stasis. If there is much inflammation, or infection about the ulcer with edema of the extremity, this cannot always be done at first. It is unwise to inject veins in an inflamed area. Where there is edema, or where the "guilty" veins lie deep under the ulcer or in the muscles, they cannot be seen and are difficult to find. Here the second method is especially applicable, namely, the use of compression to get rid of venous stasis and edema. This is accomplished by Nobl's pressure sponge,[11] or adhesive bandage. Where the ulcer is comparatively small and there is not much inflammation around it or edema of the extremity, I prefer Nobl's sponge. It consists of placing several layers of sterile gauze over the ulcer, large enough to project beyond the edge of the sponge. An ordinary good grade of rubber bath sponge is used, large enough to project an inch beyond the margin of the ulcer, and is placed on top of the gauze. The gauze can be strapped on with a couple of strips of adhesive to keep it from slipping. Any good type of elastic bandage is now applied, starting under the foot and winding upwards over the sponge, tight enough to compress the sponge to one-half of its former thickness, and then carried on up to the knee. A five yard length is usually necessary. The patient may now go on about his business. Walking on the leg thus bandaged will add a pumping effect to the existing compression effect of the sponge in ridding the underlying tissue of venous stasis. It may cause additional pain the first few hours, but as the venous congestion is diminished the pain leaves. The bandage is not removed until the patient returns in two or three days. Then the outer dressings are removed, letting the under layer of gauze next to the ulcer remain. Ten to 25 per cent silver nitrate is applied through this layer and clean gauze again added. An injection into one of the causative varicose veins can now be given before the sponge and elastic bandage are replaced. This method is repeated until all the varicose veins are injected and the ulcer healed. The sponge can then be discarded but the bandage worn for three or four more weeks. It is surprising how rapidly an ulcer will heal by this method.

When the ulcers are multiple, large and irregular, or when much edema or hard induration is present in the leg, or when associated with arteriovenous fistula, I prefer the adhesive compression bandage. It abolishes the venous stasis, diminishes the edema, reduces the size of the leg and the ulcer before any healing begins. It approximates the edges of the ulcer and presses down the margins to make it flat and relieves pain, just as the rubber sponge does. The result is that the ulcer heals rapidly beneath it. It allows the patient to be ambulatory throughout the treatment.

The technic is simple: Merely take any good grade elastic adhesive bandage and apply it from ankle to knee, overlapping one-half the width on each turn, with as much compression as the patient can comfortably stand. If there is much edema present, have the patient lie down with leg elevated until most of the edema has disappeared before applying the bandage. Reapply a new bandage every week or ten days until the ulcers are healed. Where the discharge is very profuse, I often cut a window in the bandage over the ulcer and use a rubber bath sponge as described above. This combined method has proved very helpful in certain cases. When changing the elastic bandage many varicose veins can often be seen which were hidden in edema before, and can now be injected. If irritation to the skin with eczema develops, substitute an Unna's paste cast for the adhesive bandage a few times. Wright[10] claims that by the use of the adhesive bandage alone any ulcer will heal at the rate of one square inch per week. If granulation tissue is slow in forming it can be hastened by applying constant wet dressings of thiocresol (sulphen), alternating with normal saline as described by Réimann.[12]

4. *What is the best method of handling sloughs?* Of course, being sure the point of the needle enters the vein lumen and remains within it throughout the injection will prevent sloughing. If any irritant solution is accidentally injected outside the lumen of a vein, it should be diluted at once by injecting the patient's blood or normal saline into the area in the proportion of ten parts of the diluent to one part of the irritant. Novocain (one-half per cent) can be added to the normal saline to take out its "sting" when injected. If large amounts of the irritant are injected extravenously, or if the accident occurs in areas with poor circulation, such as about the ankle or in fatty tissue, a second injection of the diluent should be made about an hour later. I usually inject one-half the amount of the diluent, massage this in for five or ten minutes, and then inject the remainder. If in doubt as to whether some of the irritant was injected extravenously, always inject the diluent. If the patient complains of burning during the injection, suspect that some of the solution is going outside the vein. If you can see or feel ballooning out of the skin with blanching about the site of the injection, you can be sure that some of the sclerosing or irritant solution has gone outside the vein. After injecting the diluent, apply a *loose* bandage over the area. Instruct the patient to apply heat here for several hours upon arriving home. Have him return in one or two days if possible. If the skin over the area of infiltration is intact and of normal color, spontaneous absorption will take place. If a hard, poorly demarcated mass is found covered with red, glossy skin which breaks on slight pressure, a slough is almost sure to develop. One can continue with the heat and apply mercury ointment, but if the mass refuses to absorb, and a necrotic area becomes clearly defined, excision should be advised. Do not wait until a gangrenous ulcer develops with the accompanying danger of secondary infection. If the excision is extended to the normal tissue, primary union usually results. Kilbourne[13] advises against early excision for fear of opening lymphatics and thus allowing spread of infection. He prefers late excision.

If the slough is small or the patient refuses excision, the gangrenous ulcer should be painted daily with a solution of gentian violet and acetone in alcohol (formula by Kilbourne[13]). I have found this reliable in preventing secondary infection. Hot, wet packs of Dakin's solution should be applied frequently each day to improve the circulation to the area and remove the necrotic material. Infra-red and ultra-violet rays aid in the same way. Sulphen solution applied as described before will hasten the formation of granulation tissue. The adhesive elastic bandage can be used in the "ulcer stage." Expect healing to be very slow with a resulting scar which is prone to contract and often become ugly.

5. *Should pregnant women be given injections?* This is a question about which very little has appeared in the literature. Most writers merely state that it is one of the contraindications to the injection treatment. This is true in Europe as well as this country. When I visited clinics abroad in 1926-27, injections were not being given to pregnant women. I understand this has been somewhat modified now. My policy up to two years ago was to use merely supportive measures, such as elastic bandages or Unna's paste casts on these patients. However, one day I had a patient referred to me by an obstetrician because of very painful varicosities about the labia majora and minora. On examination I found them to be quite large, one about the size of one's thumb. Supportive measures were of no avail here. The patient begged for relief, so I decided to inject 10 c.c. of plain 60 per cent invert sugar solution. The solution was kept in the veins for about five minutes by using pressure with an ordinary iron ring around the site of the injection. A nice non-painful sclerosis resulted. Further necessary injections were given to sclerose all the veins. The patient got complete relief from her former pain and was very grateful and happy. Since this time I have not hesitated to inject varicose veins in pregnant women, with certain restrictions, however. They are as follows: (1) Only those cases in which the varicose veins are painful or appear to be leading to the formation of an ulcer are injected. Only the painful veins are injected, as most of the apparent varicosities will disappear after the back pressure from the enlarged uterus is relieved. (2) Mild solutions, preferably invert sugar, 50 to 60 per cent, alone or in combination with sodium chloride are used. Solutions that produce severe pain or toxic solutions, especially those containing quinine, are avoided. (3) One injection is given at a sitting so the formation of a perivenitis is less likely, which, if extensive, may indirectly cause a miscarriage. No injections should be given after the seventh month of gestation. This is usually unnecessary as most painful varices appear before this time and should be injected then. Those varices that first appear after the seventh month are certainly entirely the result of mechanical pressure and will usually disappear after delivery. Supportive measures such as elastic stockings, adhesive bandages or Unna's paste casts may be used in these cases. (4) Varicose ulcers appearing during pregnancy should be treated the same as at other times. Only the veins causing or "feeding" the ulcer need be injected. Supportive measures as already described should then be used until delivery. (5) After delivery the *remaining* varicose veins can be injected. It is well to wait a month or two, or longer if they give no symptoms, before starting the injections. Contra-indications are the same as in ordinary cases, both before and after delivery.

Conclusion.—Each year new and valuable information derived from experience and scientific experimentation is appearing in the literature regarding the injection treatment of varicose veins. Five special points in treatment have been dealt with briefly, questions which seem to be uppermost in the minds of practitioners desiring to learn the treatment of varicose veins and complications.

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PATHOLOGY OF PULMONARY TUBERCULOSIS

The pathology of pulmonary tuberculosis is difficult to understand because a complex terminology has been created to "pigeon-hole" certain gross appearances of the tuberculous lung. Our mental pictures of tuberculosis pathology would be clarified were we to disregard the terminology in vogue at present and in its place interpret the whole process on the basis of inflammation and repair. All stages from acute inflammation to advanced repair may be found in different portions of one tuberculous focus. Such are the conclusions of Medlar and Sasano, who studied the pathology of pulmonary tuberculosis in successive stages in animals. Extracts from the article follow.

Tuberculosis is often set aside as a disease of distinctive pathology. It is probably true that there is some chemical specificity in tuberculous infection but morphologically the lesions represent biological reactions corresponding to those of inflammation and repair observed in infectious diseases generally. Under certain conditions, for example, tubercle bacilli may incite abscess formation and under other conditions tubercle formation. Such terms as "proliferative type," "exudative type," "caseous pneumonia," "chronic fibroid phthisis," cause confusion. They do not represent "specific" lesions, but merely stages, combinations of lesions, or appearances in the course of pathological development.

The authors studied pathological changes produced in rabbits by a very virulent strain of a bovine tubercle bacillus, whose characteristics were known by previous studies. By varying the dosage of bacilli it was possible to control in a large measure the number of tuberculous lesions. As nearly as possible all other factors were controlled.

Pulmonary tuberculosis in the rabbit differs in some respects from the disease in human beings, but doubtless the fundamental pathological principles are the same in both species. Probably the chief reason for the differences observed in the rabbit and man, is that in man previous contact with tubercle bacilli has developed some resistance to the infection, whereas the experimental animals experienced their first contact with the bacilli on the day they were inoculated. Another factor is that the rabbits were given a single injection, which contained far more tubercle bacilli than any person would inhale or ingest at a single exposure to infection.

Forty rabbits were uniformly inoculated and killed at different periods. Numerous blocks of tissue were then studied microscopically.

CONCLUSIONS

1. Massive pulmonary tuberculosis in the rabbit is dependent upon the rupture of pulmonary tuberculous abscesses into the bronchial tree and inhalation of the contents of these abscesses into the previously uninvolved lung tissue. It seems plausible that this is also the method of extensive dissemination of tuberculosis within the human lung.

2. The pathology of pulmonary tuberculosis is essentially a process of inflammation and repair. Interpreted upon the basis of inflammation and repair the complex pathology becomes greatly simplified and more easily understood.

3. The complex terminology used to describe the bizarre pathology of pulmonary tuberculosis is unnecessary and confusing.

4. The term "specific" when used in connection with tuberculous lesions should be restricted to denote a biochemical, not a morphological specificity.

An Interpretation of the Pathology of Pulmonary Tuberculosis, E. M. Medlar and K. T. Sasano, Am. Rev. of Tuberc., Dec., 1931, as cited in Tuberculosis Abstracts, March, 1932.

POSTOPERATIVE CARE OF RECTAL AND ANAL CASES

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FROM the moment rectal or anal surgical patients are put in bed after the operative work is completed until their wounds are healed constitutes an important time, concerning which most patients have no little bit of fear. They have heard stories of severe postoperative suffering from persons who have undergone similar operations in the past; it reflects no credit upon the medical profession to have patients state that were it not for the pain they have understood such surgery entails they would have been in for treatment long before. Moreover, the frequency with which anal and rectal operative cases require subsequent reoperation may oftentimes be laid to inappropriate or neglected postoperative care.

After any anal surgery, it is well to keep hot packs to the wound as soon as the anesthesia has cleared off sufficiently to let the patient be conscious of the fact if the packs are hot enough to burn. I leave specific instructions with the nurse to apply a boric acid pack at 110° F. as soon as the anesthesia is gone and to change this pack with a fresh one hourly. It is well to keep these patients lying on their side with a pillow maintaining the hot pack in position. A change from one side to the other as the pack is changed each hour keeps their hips comfortable. The hot packs keep edema in the operative area at a minimum and tend to keep down postoperative pain by allaying spasm in the anal sphincter. Six hours of the hot pack per day is enough and this is cut down over the course of four or five days.

One of the advantages of the preoperative administration of nembutal is the long and restful sleep these patients obtain after their anesthesia has left them. Any patient experiencing any real pain is given from one sixth to one quarter grain of morphine hypodermically. Usually after the first day any pain they may have is effectively controlled by one grain of codein sulphate and ten of aspirin.

Some ten per cent of patients will have to be catheterized one or more times after such surgery. It is not advisable to allow them to go more than twelve hours without voiding although as the bladder becomes distended if an orderly or nurse will assist the patient in standing erect many catheterizations may be avoided. Patients who continue having trouble voiding are put in a hot sitz bath for twenty minutes.

At the end of forty-eight hours the patient is taken into a dressing room and under good light and ample exposure the iodoform gauze and gutta percha drain left in the anal canal at the time of the operation are gently removed. The manner in which this is done and the care exercised in loosening these dressings makes this first dressing either a nightmare or an incident. The anal canal is irrigated with some mild antiseptic such as boric acid or pure witch hazel so that the field is mechanically well flushed out. For this I use a metal tube three and one half inches long and three-eighths inch in diameter which has many small perforations throughout the distal two-thirds and has a short piece of rubber tube attached to the other end. Through this the irrigating fluid is forcibly injected. A piece of gauze is held about the anus as the fluid is injected so that any overflow may be absorbed. Mercurochrome on an applicator is gently painted over the open wound and one of the anesthetic powders supplied commercially is sprinkled about on the wound. Within a few moments the pain incidental to removing the dressing has left and the patient is comfortable again. A small piece of absorbent cotton is left tucked into the anal canal and the patient is instructed to change this with a dry piece every hour or often enough to keep the wound dry.

The first dressing having been accomplished, the worst part of the ordeal for the patient is over. He is now told he may allow his bowels to move. Usually this is all that is necessary. However, should he not have had a stool by the next day a small warm soapy enema is given. At this point in the patient's convalescence he is educated in giving himself an anal irrigation and is told to carry out this irrigation after each and every bowel movement. He is given a fountain syringe with an 18F catheter attached to the hose containing four ounces of water at 110° F. and shown how to put the catheter tip just inside the lower end of his anal canal. In this manner the water will not enter the rectum to act as an enema but will simply wash out the anal canal and provide a clean wound. These people are advised to either lie down or stand up, as sitting seems to definitely slow up the healing process.

The patient who has been on a soft diet until now is put on a full general diet and encouraged to eat. In the event that they had been troubled by constipation prior to their operation, the diet is of an anti-constipation type and dry agar may be added if the diet alone is insufficient to provide one or two formed stools each day. No effort is made to inject oil into the rectum or give mineral oil orally for the purpose of keeping the stool soft or liquid. The formed stool is the best dilator the anal canal can have and it is a mistake to sacrifice this dilating effect on the anal canal for the temporary comfort obtained by the soft stool.

Dressings subsequent to the first day are carried out much in the same manner as the first one. Other antiseptic agents such as dichloramine T solution in oil or hexamethylenamine or metaphen may be used instead of mercurochrome, depending on how much superficial infection the wound shows the first few days. The anesthetic powder may be dispensed with after the first few dressings and if the wound shows considerable secretion some dry absorbent powder as thymol iodide may be used.

Perhaps the most important thing that daily attention to the wound affords is the observation of the manner in which healing is taking place. Sulci in hemorrhoidectomy wounds must be kept open and draining externally lest they close over and an abscess form underneath; fistulectomy wounds must be kept clean and dry, but no packing left between the cut ends of the sphincters; mucous membrane must be kept from bridging across to form pockets, and granulation tissue must be kept down flat with the skin margins rather than allowed to pile up in a thick tuft. It is well to insert a finger into the anal canal frequently to make sure that the healing process is not encroaching on the caliber of the anal canal.

After healing is complete and the patient ready for discharge, advise him to keep on with the hot irrigations after bowel movement and to keep the cotton tucked in the anal canal for another three weeks. Oftentimes although the wound has healed across, a large or hard stool will rupture the thin, newly healed wound, and if anal cleanliness is not observed, infection will keep the wound open and cause all the good work up to this time to be undone.

The customary hospitalization period varies from four to seven days, at the end of which patients have been up and about long enough to feel strong again, and they have been educated in the care of their wound after they leave the hospital. An average period of three weeks has been found to be the customary time required for the simple anal wound to heal. Large fistulectomy wounds, many pilonidal cyst excisions and any complicated wound will extend the postoperative period in proportion to the size of the wound or the handicap which any complication may place upon healing.

Observation of many of these wounds has convinced me that adequate attention postoperatively makes for greater comfort and a shorter period of convalescence, as well as better end-results.

CASE REPORT

SPONTANEOUS PNEUMOTHORAX*

Arthur A. Wohlrabe, M.D., F.A.C.P.
Minneapolis

Spontaneous pneumothorax is defined as the presence of air in the pleural cavity due to internal causes and not introduced by artificial or accidental means. The term was coined in 1803, by Itard, who found this condition in necropsies of patients who had died of tuberculosis.

Laennec, the inventor of the stethoscope, first recognized penumothorax during life.

In a study of respiration in patients with pneumothorax Means and Baldwin found that one lung will do the work of two until three times the normal aeration is called for. The condition is similar to that of a diseased heart which is compensated up to a certain degree. A partial collapse may occur in both lungs at the same time but if it is complete in both death results very soon.

Etiology.—Various writers list tuberculosis as the cause of spontaneous pneumothorax in 80 to 90 per cent of cases in adults and in 40 to 50 per cent in children. It occurs more often in the male between the ages of twenty and forty. Other causes are pneumonia, gangrene, empyema, lung abscess, emphysema, hemorrhagic infarct, bronchiectasis, pertussis, diphtheria (tracheotomy), foreign body aspiration, influenzal bronchitis and unknown (idiopathic).

The idiopathic group is small. About seventy-five cases have been reported all told. Palmer and Taft reported five cases in 1930. The group includes those in which no known cause can be demonstrated. In a series of cases reported by Lemon and Barnes no known cause was found in six out of fifty cases. In this group there may be undiagnosed tuberculosis, there may have been a rupture of an emphysematous bleb, or a viscero-parietal adhesion may have torn resulting in a tear into the air cells of the lung. These cases are rarely fatal and recovery occurs in a month or six weeks. Healing should be complete within eight weeks unless complications arise. If recovery is prolonged beyond this period, the case in question should not be classed with the iodiopathic group. Two of Palmer and Taft's patients had massive intrapleural hemorrhage but recovered.

Zahn is quoted as listing the etiology of the idiopathic group as follows: (1) rupture of a vesicular bleb; (2) rupture of an interstitial emphysema bleb, the air finally reaching the pleura; (3) the direct tear of the pleura by the tug of an adhesion; and (4) senile atrophy of the pleura.

Frequently pneumothorax will occur on one side following recovery on the opposite side. Hamman has noted sixteen such instances in the literature.

Pneumothorax may be simple or complicated with exudate which may be transient or prolonged. It may be of the check valve type. When the opening closes early the air is quickly absorbed.

The actual incident in producing the tear which allows air to reach the pleural cavity may be sneezing coughing, hiccough or any sudden strain. As in the case which I am about to report there may be no definite evidence of an exciting event. It has occurred during rest or sleep.

In tuberculous cases the onset may be gradual on account of many pleural adhesions. In the absence of adhesions the onset is sudden and associated with sharp chest pains radiating to the neck or shoulder.

Diagnosis.—As a rule there is little or nothing in the history which will aid in diagnosis. Even after physical examination the exact condition will often be missed. The roentgenogram, however, is characteristic and definitely diagnostic. The type—unilateral or bilateral, partial or total, unilocular or multilocular, simple or complicated—is at once recognized. Marked depression of the diaphragm on the affected side and a displacement of the mediastinum toward the unaffected side suggests the check-valve type.

Signs and Symptoms.—Symptoms vary with the type of onset. If the onset is sudden there is pain, usually sharp and severe. It may be most marked substernally and radiate to the shoulder. Air hunger and cyanosis may be pronounced. The patient has an anxious expression and his heart is rapid. Cough may become very annoying. If the onset has been gradual the symptoms will be less marked or entirely absent. Later as the chest becomes more filled with air the patient complains of fullness and heaviness. He prefers to lie on the affected side. In a few days there may be no symptoms unless fluid accumulates.

The side involved is more prominent and the intercostal spaces are well filled out. The presence of maximum inspiratory resonance during both phases of respiration is the best physical sign. The percussion note is tympanitic. Breath sounds are distant or absent. If fluid is present there is a succussion splash and a shifting of dullness.

The right side is involved more often than the left.

Prognosis.—As a rule the prognosis in the idiopathic variety is excellent provided the storm of the sudden onset is survived and provided it is unilateral. In bilateral cases death occurs within a few hours unless one lung is only partially collapsed.

In 1902 Fussel and Reisman collected fifty-six cases from the literature. Only one of these had died. In Staloff's list of eighty-four cases of *all* varieties of pneumothorax the mortality was 57%. Recurrences either on the same or opposite sides are common.

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*Presented before the Lymanhurst Medical Staff December 22, 1931.

Treatment.—Rest in bed is important. Strapping the affected side may give some relief.

Cough and pain should be controlled by sedatives. If fluid accumulates to any marked extent thorocentesis should be performed at intervals, a part only of the fluid being withdrawn so as not to reopen the fistula.

If the fluid becomes purulent, as is likely following pneumonia or lung abscess, free drainage should be instituted.

In the valve type of pneumothorax or if dyspnea becomes severe it may be necessary to aspirate enough air so that the lung can expand. This should be done under manometric control. Most patients adjust themselves very quickly to the new respiratory conditions and do very well under expectant treatment.

CASE REPORT

E. S., a university student, aged 26, came to my office on January 8, 1931 complaining of pain in his right chest and substernally. The pain radiated to the right scapular region and was most marked on deep breathing or on walking. There had been no weight loss, no night sweats and no hemoptysis. He tired easily and was dyspneic on exertion.

The present trouble began about December 1, 1930, with a persistent and productive cough, evidently an acute bronchitis. On December 14, 1930, he had pain in his right chest probably due to pleurisy. The sputum was examined and found negative. He continued his studies until Christmas vacation. He was apparently well at that time.

On January 1, 1931 while at home during the holidays and while resting on a couch before the noonday meal he noticed a peculiar sensation in his chest coming on after clearing his throat. The distress increased and he began to cough so persistently that he was able to finish his meal only with difficulty. He then began to notice dyspnea and palpitation. His heart rate was greatly increased. In the afternoon he walked to a physician's office and was given a sedative and digitalis. He kept quiet for a few days and returned to the University on January 6th.

Because of the persistence of his cough and substernal soreness and pain he was urged to have further studies made.

On physical examination the patient appeared somewhat undernourished. He weighed 175 pounds and measured seventy-six inches. His color was good and he appeared free from pain.

The right chest seemed more prominent than the left and was hyperresonant. There was no evidence of excursion of the right diaphragm. Breath sounds were distant or entirely absent. The heart action was normal and the rate was 80. The blood pressure was 126 systolic and 80 diastolic. Temperature was normal.

The nature of the disorder was not recognized until the patient was placed behind the fluoroscope when it became evident that he had a complete right-sided pneumothorax. A plate was made for record. There was only a very small amount of fluid in the right costophrenic angle.

Because there was a question as to when this man could return to school, Dr. Jay A. Meyers was asked to see him as consultant. The patient was advised to stay in bed and he returned to his home in another city.

On February 24th he returned to Dr. Meyers' office with a roentgenogram, taken a week earlier, which showed the lung completely expanded. There was no evidence of pulmonary infiltration or other abnormality. The tuberculin test was negative.

On March 5th, he was feeling very well except for an occasional sharp pain in his right chest. His weight was 176 pounds. On physical and fluoroscopic examinations the chest appeared normal.

On November 19th, he reported that he never felt better and had had no pain for two months or more. He had no cough. Pulse, temperature and blood pressure were normal. His weight was 176 pounds. The chest presented normal findings. On fluoroscopic examination the lung areas were clear, there was no evidence of adhesions and the diaphragm was free.

Dr. H. D. Lees of the Students Health Service examined this man on February 24, 1930. Physical and roentgen findings of the chest were normal at that time.

CONCLUSIONS

This patient should be classified in the idiopathic group because no evidence of tuberculosis was found, because his acute bronchitis of December 1, 1930, had subsided and because he made a rapid and complete recovery and has remained well to this day.

It is probable that idiopathic pneumothorax occurs more frequently than is generally supposed because it is so easily overlooked unless a roentgenologic examination is made.

PRESIDENT'S LETTER

AN essay entitled, "The Next Twenty Years," written by Hans Zinsser of Harvard University, delivered at the opening of the new Lakeside Hospital in Cleveland and published in *Science,* October 23, 1931, is of unusual interest. Zinsser pointed out that in the last twenty years the medical profession has cleaned house, as it were. Whereas in 1910 we had 166 medical schools, we now have only sixty-six, but these are turning out a vastly better quality of physician than did their predecessors. Any one who has been in contact with this stream of recent graduates can vouch for this assertion. That these young men can have attained so much knowledge and understanding of the fundamentals of medical science and at the same time so much intelligent and definite information of the new things in medicine, is a credit to their respective universities. Zinsser expects that the rapidity of growth and expansion of hospitals, laboratories, and so forth, will now be slowed down and that we must learn to take advantage of all the wonderful equipment and tools we now possess.

Nothing is so constant as change and those in authority at large institutions having to do with the affairs of medical education and research, and consequently medical service to the public, are aware of this. Economic factors, often little understood, create demands that make for changes. Our own university has taken an important step in the last year, giving evidence that our Board of Regents realizes that it is impossible for one man in the position of dean to be efficient in the purely administrative side and to carry alone also the various responsibilities that go with educational, curricular and university affairs. The creation of the office of Dean of Medical Sciences is a distinct step forward.

Dr. W. J. Mayo has advised providing shorter elective courses in the various business, academic, and scientific fields, not necessarily leading to degrees, to suit the wants and the ability of the individual. In this manner would sources of information and leadership be afforded to the public to offset the misleading teaching of demagogues.

There are many questions that puzzle the thinking man in medicine. Are there too many graduates? Is too much emphasis placed on research and investigation? Are we trying to put men through a common mould, when better study of them as material, and selection of the proper mould to suit would be wiser? The old question of full-time teaching in clinical branches no doubt will gradually be solved, but it must be solved by the medical profession in an unselfish spirit. Are the American educational foundations forcing this system on the schools?

Professor Zinsser's article is written in an interesting and philosophical strain and is well worth reading. My reason for bringing it to your attention at this time is because in such periods as these we are more likely to pay attention to affairs that affect us from without our ranks and neglect that which might be termed our internal affairs. Medicine need not fear for it is a necessary and a most valuable part of the life of our nation. Zinsser says: "The fields of our endeavor have been fertilized with a beneficence and a public confidence unheard of in the history of education." We must keep our eyes on the future, safeguard what has already been attained, steer our course straight, and remain worthy of the generous support we have had from a kindly public.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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MANTOUX REACTIONS AND TUBERCULOSIS IMMUNITY

Science looks yearningly to the possibilities of direct immunological methods directed toward tuberculosis, such as have accomplished so much with diseases like typhoid and diphtheria. In the meantime, not a little difference of opinion appears in the theoretical attitudes of men closely applying themselves to the laboratory and clinical problems of tuberculosis. Disregarding the general immunity bestowed upon individuals by nature, resisting all inimical agents detrimental to health or inviting disease, it is worth while to bestow particular attention upon such evidence of specific immunity as is now available. We may start, therefore, with the most approved skin reaction to tuberculin—the present Mantoux test. This is probably the most efficient agent yet devised with which epidemiologists, finding reacting youngsters, are in a position to investigate their elders for open contacts (often labeled chronic cough but really benign tuberculosis).

Minnesota and the adjoining neighbor states are essentially rural. Present day skin tuberculin tests among school children, candidates for college or nursing training schools, are showing a much lower level of positives than were shown some twenty years ago, when the late Dr. Lampson made a study of a sufficient number to give his statistics widespread quotation. Those who have strongly supported the sanatorium segregation program, as well as improved general hygienic living, hope that history will ultimately connect up this lessening of childhood or early adolescent primary (Ghon) inoculations, and later bodily (allergic) response, with this effort. Theobald Smith early enunciated the idea that the bodily defense reaction in the biological sense not only defended the host but the organism as well, thus establishing a friendly alliance "for better or for worse"—at least with no desire on the part of the tubercle bacillus to immediately perish with its host, as do the rapid and fatal epidemic disorders, such as bubonic plague. In other words, this neutrality paves the way for a trench warfare in which "cavitation and cough" (consumption) provide the stage for "droplet" transmission.

At this point opinions begin basically to differ. Minnesota continues to proffer important clinical and epidemiological evidence. Geer† shows that of nurses entering a large general hospital in St. Paul only 30 per cent showed reactions to the intradermal tuberculin on entrance, but practically all are positive before completing training. Over a two-year period six nurses have developed clinical tuberculosis and only one of these showed a positive tuberculin Mantoux on entrance. This is rather striking confirmation in

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†Geer, Everett K.: Tuberculosis among nurses, Arch. Int. Med., 49:17 (Jan.), 1932.

America on the report of Johannes Heimbeck‡ from Oslo in 1928. Somewhat alarming reports come from certain of our large eastern medical centers in terms of interns and their college and hospital residence and training. David I. Stewart of Ninette Sanatorium, Manitoba, recently writes that he considers a positive Mantoux in the adult the best specific safeguard against any fresh pickup of tuberculosis, except possible "massive infection," which, of course, every sane individual, of whatever age, would seek to avoid.

In rather direct contrast to this attitude is that of the Lymanhurst School of Minneapolis (Dr. J. E. Myers and his associate), who hold that this early Ghon regional tuberculosis response can in no way be held to be fortuitous, but that it rather prepares the stage or paves the way for a later adult response, which takes on the attitude of chronicity, dissemination, and prospect for fatality. They agree that the first contact (Ghon) need not always be mild, and admit that some constitutional dissemination with meningeal involvement can result. To those familiar with consistent autopsy revelations this cannot be denied. However, they proceed to emphasize the need of considering any and all Mantoux-positive school children, college folks, and presumably all adults, as dangerous fodder for tuberculosis, and, indeed, like gold "earmarked for export." They are, indeed, the immediate concern of zealous hygienists, if not therapeutic opportunists. It should be emphasized that this point of view is more encouraged by those whose interests are more and more epidemiological and less concerned with the aftermath of anxiety and perturbation incidental to any type of "earmarking."

Geer's statistics seem to indicate that, in contrast to the smaller private hospitals, large general hospitals pick up more concealed cases of tuberculosis, masquerading under other entrance diagnoses, from which careless spitters give not only the avenue for inoculation of previously non-reacting personnel, but also in furnishing "massive infection" to all; furthermore, that whatever relationship positive Mantoux may have to the question of constitutional immunity, those recently made positive by contact either develop a first inoculation which is not mild and self limiting, or a persistent one that induces consumption. The evidence given, however, would indicate that Geer's clinical cases were not essentially different from those accepted as the usual adult response. Pathologists are not ready to abandon the attitude of Theobald Smith, and it is difficult to convince them that viable tuberculosis germs do not abide about the original tubercles and the regional hilus caseating glands. The clinician studying children most closely is likely to attribute too much significance to the entire group on account of the relatively limited number in which he may demonstrate roentgen shadows indicative of hilus or parenchymal invasion. Reasoning from these, he would appear to be too critical of the much larger group, in which his admittedly inefficient stethoscope is little less accurate than the most definitive roentgen films. Furthermore, American clinicians up to date have given far too little consideration to Assman's epoch-making observations upon the adult exudative subclavicular extensive shadowing, beginning as dramatically as does the allergic response of the skin to urticaria or angioneurotic edema. These points have not been sufficiently considered, and we are still in the dark as to the relative proportion of these that arise from fresh external reinfection or from Herxheimer-like reactions about old childhood foci. The difficulty persists to determine the status of the individual's immunity in terms of such factors as pregnancy, intercurrent infections or biochemical disturbance. Nevertheless, the present evidence would appear to make it totally unfair to invidiously "earmark" so many young Mantoux reactors.

E. L. T.

THE ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

The Annual Congress on Medical Education, Medical Licensure and Hospitals, held under the auspices of the American Medical Association in Chicago on February 15 and 16, was very well attended and seemed a more interesting meeting this year than usual.

The high light of the meeting seeemd to be the discussion of the hospital situation. Dr. Ray Lyman Wilbur came out very strongly opposed to any marked extension of the federal hospital program for veterans of the World War. In fact, a great deal of the meeting seemed to center around hospitals and hospital service, and the economics of the medical profession came in for an unusual amount of discussion.

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‡Heimbeck, Johannes: Immunity to tuberculosis, Arch. Int. Med., 41:336 (March), 1928.

In the section of Medical Education various remedies were suggested for the cost of medical care and Dr. Hugh Cabot seemed to take the center of the stage with his idea of big business in medicine. The papers quoted him liberally and his theory that corporations should deliver medical service to their employes on a large scale and for minimum cost. Dr. S. Marx White was given credit for the idea that more group practice might help the situation. Dr. Steven Rushmore, of Boston, seemed to feel that neither of these remedies would have any effect on the situation.

The topic which seemed to attract most attention, according to the attendance reported, was the care of veterans, in the Annual Conference on Hospital Service. The Chairman, Dr. Mock, opened the subject with a very illuminating discussion, asking for sincere study of the situation, taking the stand that for the veterans themselves the increased use of federal hospitals for non-service-connected disabilities would result in poor medical treatment for the veteran. Mr. Ed Hayes, member of the National Rehabilitation Committee of the American Legion, gave a very eloquent discussion of the situation, asking for the earnest coöperation of the American Medical Association in working out the best possible plan for the care of disabled veterans. Mr. Paul Fesler, President of the American Hospital Association, discussed the various conferences which have been held with the American Legion and the American Medical Association. He urged that the community hospital should be used for veterans who are now waiting for treatment because of lack of facilities of the federal hospital. He also spoke of the McClintic Bill, asking for a change in the law so that veterans might be taken care of in community hospitals by the local physicians. Dr. Elliott, of Chicago, urged greater interest in the care of cancer cases. There was considerable general discussion and the consensus of opinion seemed to be that the use of the community hospital and its development is the most important factor in the proper care of the general acute medical and surgical conditions among the veterans and that the early treatment of acute medical and surgical conditions was the greatest factor in preventing chronic disabling conditions leading to permanent hospitalization.

At the luncheon of the American Hospital Association on Tuesday plans were made for careful study of costs of the care of veterans in federal hospitals and the civilian hospitals, particularly as applied to similar groups of cases. It was expressed there by Mr. Hayes and a number of others that a good slogan next year for the American Legion and the American Hospital Association would be the standardization of the community hospitals throughout the country, looking forward to their increased use for disabled veterans at government expense. There was a general expression of opinion for continued coöperation not only nationally but in every state, looking forward to the better solution of the care for disabled veterans. It was generally agreed that the government should continue to provide facilities for the care of nervous and mental conditions, tuberculosis, and other chronic disabling conditions in veterans, but that the policy of the future should look toward the care of all medical and surgical conditions, and especially the acute medical and surgical conditions, in the local community.

C. B. Wright.

HEALTH INSURANCE

According to some recent newspaper reports there seems to be some indication that one of the recommendations of the Committee on the Cost of Medical Care of which the Secretary of the Interior, Dr. Ray Lyman Wilbur, is the chairman, will be the adoption of some form of insurance as the solution of the unequal distribution of the high cost of sickness.

Editorial advocacy of this solution to the difficulty has appeared in our columns from time to time. Health insurance is not new even in our own country. Unfortunately some insurance companies have had adverse experience in this type of insurance. The solution advocated therefore is not likely to be simple in execution.

It is perhaps not surprising that most individuals are anxious to collect from insurance policies of every kind. It is a sad commentary on the innate honesty of human nature that a large percentage of individuals are prone to exaggerate illnesses in order to collect on their insurance. Such an attitude places the certifying physician in an awkward position and too often he yields to pressure and stretches the truth as to the real disablement.

All types of insurance are abused at times by the unscrupulous. This does not seem sufficient reason for condemming health insurance as a whole. The mutual character of certain group insurance seems to exert a restraining influence on the unscrupulous which is lacking in other quarters.

Other factors will militate against the successful adoption of a general insurance program. One is the variation in the cost of medical care in various localities.

While the total cost of sickness in the country at large is not much more than it should be for value received, the indications are that the rates necessary will be more than the man with the average income is likely to want pay voluntarily. He will be inclined to take the chance that he and his family will escape serious illness. The question will then arise as to the advisability of compulsory insurance.

Ideally, health insurance should be universal. The fact remains that someone pays the cost of sickness as conditions exist at present. The cost of the care of the indigent can be found in taxes, community chests, and other forms of charity, not the smallest item being the free services rendered by the medical profession. The well-to-do, although occasionally inconvenienced by the cost of sickness, can usually take care of such emergencies. The remainder of the population, which constitutes the large majority of individuals, are the ones who require some form of insurance.

The question is sure to arise as to the advisability of the government going into the business of health insurance. Many nations have adopted some form of government insurance. Where the patient retains the right to choose his own physician seems the least objectionable form of government insurance.

The medical profession in this country is opposed to the government's providing health insurance or entering any business that can be handled by private enterprise. One has but to reflect on past experience to be convinced that governmental management is extravagant and sure to become involved in politics.

It is to be hoped that an insurance genius will bring forth some solution to the problem of furnishing health insurance to the public at large. The extensive study of the subject being completed by the Committee on the Cost of Medical Care should furnish the necessary data for this solution.

OF GENERAL INTEREST

Dr. and Mrs. Roger G. Hassett, Mankato, Minnesota, are the parents of a baby son, Roger, Jr., born January 24, 1932.

Dr. Silas Anderson has been elected new chief of staff at St. Andrew's hospital, Minneapolis. Dr. W. H. Ude was named vice chief and Dr. F. R. Gratzek secretary-treasurer.

Dr. Arthur Edward Smith, Minneapolis, has been appointed Chief Oculist for the Minneapolis, St. Paul and Sault Ste. Marie Railway, effective January 1, 1932.

Dr. Hilding Berglund has resigned as chief of the medical department at the University Medical School, effective June 30, 1933, and will spend the year beginning July 1, 1932, in absentia.

Dr. C. J. Litzenberg of Minneapolis appeared as one of twenty-four lecturers chosen from throughout the United States at the forty-eighth annual convention in Memphis, Tenn., of the Mid-south Post Graduate Medical Assembly held February 9 to 13.

Dr. E. W. F. Exley, recently associated with the Goslin Clinic, Green Bay, Wisconsin, has returned to Minneapolis, where he has opened an office at 1649 Medical Arts Building for the diagnosis and treatment of genito-urinary diseases.

Dr. J. F. McClendon, Professor of Physiological Chemistry at the University, will leave about the middle of March with his family to accept an invitation to spend a year as Visiting Professor under the Rockefeller Foundation at the Tohoku Imperial University at Sendai, Japan.

Dr. Murl J. Robertson, graduate of the University of Minnesota Medical School, 1930, who spent the past year as Interne in the Detroit Receiving Hospital, Detroit, Michigan, has purchased the practice of the late Dr. Mertens of Bayfield, Wisconsin.

Dr. Robertson is the son of Dr. J. B. Robertson of Cottonwood, Minnesota.

The University of Minnesota Medical School had as a visitor last month Dr. Ebaugh, Director of the Colorado Psychopathic Hospital, who is making a survey of all the medical schools of the country for the Mental Hygiene Board. Dr. Ebaugh is reported to have been impressed with the need for development of the work in psychiatry at the University and that a psychopathic unit is one of the great needs of the University at the present time.

The next written examination of the American Board of Obstetrics and Gynecology will be held in nineteen different cities of the United States and Canada at 2

p. m., on Saturday, March 26, 1932. The general, oral and clinical, examination will be held in New Orleans on Tuesday, May 10, 1932, immediately preceding the meeting of the American Medical Association. Reduced railroad fares will be available. For detailed information and application blanks, apply to the Secretary, Dr. Paul Titus, 1015 Highland Building, Pittsburgh, Pennsylvania.

Dr. W. I. Lillie of the Section of Ophthalmology of The Mayo Clinic is spending six weeks in Shikarpur, India, at the Seth Heranand Charitable Eye Hospital where Mr. H. T. Holland, F.R.C.S., of the Church Missionary Society Hospital, Quetta, Baluchistan, India, is holding his annual eye clinic. Large numbers of ophthalmologic operations are being performed, and Dr. Lillie, and Dr. O. B. Nugent and Dr. A. B. Cushman of Chicago, are sharing in the work. Dr. Lillie will leave Shikarpur, February 16, for Bombay. From there he will travel to Tokyo, and then across the Pacific to Vancouver. He will arrive in Rochester April 1.

Dr. Leonard G. Rowntree, Professor of Medicine, University of Minnesota, and senior consultant in medicine and director of clinical investigation of The Mayo Clinic for twelve years, has been chosen medical director of the Philadelphia Institute for Medical Research.

Dr. Rowntree will leave the Clinic in mid-summer to take up his work as director in the newly developed institute in the autumn on completion of the building in Philadelphia.

Dr. Rowntree came to Rochester in April, 1920. Previously for four years, he was director of the department of internal medicine at the University of Minnesota.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

OPERATOR OF BEYER SYSTEM CLINIC PLEADS GUILTY

State of Minnesota *vs.* Cary Beyer

On January 18, Carl Beyer, operator of the Beyer System Clinic, located in the Loeb Arcade, Minneapolis, Minnesota, entered a plea of guilty to practicing healing without a Basic Science Certificate and was sentenced by the Honorable Frank E. Reed, Judge of the District Court, to pay a fine of $200.00 or serve sixty days in the Minneapolis Workhouse. The defendant paid the fine. In imposing sentence, Judge Reed informed the defendant, in no uncertain terms, that if he were brought back before the court for a second violation of practicing healing without the proper license, he would be given the maximum penalty of one year in the workhouse with no chance to pay a fine.

For several years Beyer has been operating the Beyer System Clinic and advertising the successful treatment for diabetes, gall stones and other serious ailments, over the radio and in the Twin Cities daily newspapers. As a result of this advertising, Swen Bonderson, a farmer living near Shafer, in Chisago County, Minnesota, took his sixteen-year-old boy to the Beyer Clinic for treatment of diabetes. Bonderson paid Beyer $325.00 cash in advance, for a successful treatment for his boy. The condition of the boy did not improve and Mr. Bonderson, upon discovery of the fact that the defendant was not licensed, made a complaint to the Medical Board. Beyer was arrested on January 8, and released on $1,000.00 cash bail.

Beyer was formerly connected with the Loring Park Clinic of Minneapolis and for some time prior to 1914, he was in the patent medicine business in Winnipeg, Manitoba. He claims to be from Austria and to be a dietitian.

The conviction of Beyer marks the end of one of the most open violations of the medical laws of this state. Beyer was listed in the building directory as a doctor. The only proof discovered by the Medical Board that the defendant was a doctor, is a diploma hanging in his office indicating that Carl Beyer had received the degree of Doctor of Herbology in 1909, which diploma is absolutely worthless in this state in so far as any right of the defendant to practice healing is concerned.

Judge Reed is to be highly commended for the vigorous and emphatic manner in which sentence was imposed upon the defendant. Such a frank expression by the court as to what lies ahead of the defendant for a second violation of the medical laws of this state does a great deal more to eliminate quackery than the imposition of the sentence itself.

CHIROPRACTOR PLEADS GUILTY TO PRACTICING MEDICINE

State of Minnesota *vs.* Frederick I. Sheldon

On February 2, 1932, Frederick I. Sheldon, licensed chiropractor with offices at 800 Nicollet Avenue, Minneapolis, Minnesota, entered a plea of guilty to a charge of practicing medicine without a license, filed against him following an investigation of his activities by the State Board of Medical Examiners.

Sheldon was sentenced by the Honorable Frank E. Reed, Judge of the District Court, to a term of three months in the Minneapolis Work House. After admonishing the defendant to confine his practice to that of chiropractic and warning him that in the event of another prosecution he would be compelled to serve the three months Work House sentence, Judge Reed stayed the sentence for one year.

Complaint had been made to the Medical Board by Mr. Henry Berg, 2941 Pleasant Avenue, Minneapolis, that Mrs. Berg had been under Sheldon's care for several years and was being treated with so-called Lowenthal capsules furnished to Mrs. Berg by Sheldon. Mr. Berg claims that he was being charged $8.00 per box of 100 capsules. The prescribing or use of any such treatment by a chiropractor is a positive violation of the Medical Practice Act and resulted in the filing of a complaint against Sheldon. Mrs. Berg's ailment has been diagnosed as paralysis agitans.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Let the Doctor Decide

This is the year set for that imposing and expensive body, the Committee on the Cost of Medical Care, to write its prescriptions for the cure of medico-economic ills.

If certain recent publicity issued by Chairman Secretary of the Interior Ray Lyman Wilbur, Chairman of the Committee, may be taken as a sign, the prescription will be for a system of civilian health insurance with the government, possibly, writing the policies.

At any rate, a significant front page story appeared in February in the United States Daily, that unique publication under the management of the newspaper correspondent, David Lawrence, devoted wholly to government news, and it came direct from Secretary Wilbur's office with his official approval.

> "To relieve patients of the heavy costs of medical care in the United States," says the story, "it has been suggested that a system be worked out for the regular and orderly payments like life insurance payments, the Committee on the Costs of Medical Care announced in a statement received today from the Department of the Interior. The statement of the committee, of which Ray Lyman Wilbur is Chairman, follows:
>
> "'The costs of medical care might be modeled on a system of regular and orderly payments like life insurance in order to remove some of the difficulties attendant upon the present system of medical care and costs, it was suggested by Miss Mary Dublin in a paper just submitted to the Committee on the Cost of Medical Care.
>
> "'This important suggestion *may be of epochal significance to the health of the entire nation* (the italics are ours) was made as a result of a study of the comparative expenditures for insurance and the expenditures for medical care.
>
> "'Miss Dublin's survey is being published, the Committee points out, as one of its miscellaneous contributions and a possible help in answering the question: How may the ordinary family provide against an uncertain financial burden which may be very large in proportion to the family budget and which is likely to be uneven month by month and year by year?'"

There is more in the statement to the same general effect.

Is organized medicine ready to take a stand for or against such a proposition if it is, indeed, incorporated in the final recommendations of the Committee? Ready, that is, with figures and facts to match the glittering array that will be cited by Committee protagonists of health insurance?

Will organized medicine be ready to show by an equally exhaustive and complete study of results of national health insurance in France and Germany and England, for example, that its position on the question is founded upon equally sound and disinterested observation? The report of the Committee on the Cost of Medical Care will be a challenge to the statesmanship and stability and alertness of the medical profession. A recommendation on the part of the Committee for general health insurance will automatically create a serious problem which cannot be met by a scowling resistance on the part of the profession. If it is possible for one people to learn from the mistakes of another, then America will not fall into the error that is reducing medical practise to the football of depleted budgets, or government rules and regulations in other nations.

Health Benefits Increase Among Employees

Three hundred and fifteen commercial and industrial institutions out of a total of 602 who replied to a questionnaire sent out by the United States Public Health Service now have some form of insurance and health benefit service for their employees.

As a general conclusion of the reports of the 315, the Public Health Service cites the following paragraph:

> "As a time-tested organization attempting to meet the needs arising from certain contingencies in the life of the wage earner, the employees' sick benefit association appears to have found a place for itself in many industrial and mercantile firms. In recent years a number of them have gone beyond the original plan in an attempt to explore and develop new fields of service and usefulness to their members. One of these relatively untilled fields consists of organized effort to obtain accurate diagnosis followed by appropriate medical attention and nursing care including hospitalization if needed and to secure such in the early states of disease so that the duration of disability may be shortened as much as possible. Another important field which the more audacious organizations are beginning to till is that of disease prevention including (a) the discovery and correction of physical impairments which if neglected may cause disability and (b) health educational activity, especially in the hygiene of living."

OBITUARY

Dr. Albert E. Flagstad

1891-1932

Dr. Albert E. Flagstad was born in Minneapolis and died at the age of forty on January 26, 1932.

A graduate of the University of Minnesota Medical School, he became associated with the late Dr. Arthur Gillette and later with Dr. C. C. Chatterton and William H. von der Weyer with offices at the Moore Building, Seven Corners, St. Paul, and contributed his services to the Gillette Hospital for Crippled Children, St. Paul, until his death. His last operation, in fact, was performed at this hospital, when already ill, less than a week before his death.

Dr. Flagstad was appointed deputy coroner in Hennepin County and opened an office in Minneapolis for the practice of orthopedics two years ago, taking a suite with his brother, Dr. Carl Flagstad, dentist, at 1549 Medical Arts Building.

A member of the Hennepin County Medical Society and the Minnesota State Medical Association, Dr. Flagstad also had membership in the American College of Surgeons and the American Orthopedic Association. He was also a member of the Phi Rho Sigma medical fraternity. He is survived by his widow and daughter, and a brother, all of Minneapolis.

Dr. Flagstad was recognized for his ability in his chosen field of orthopedics, his limitless energy and his devotion to his patients.

Dr. J. A. Freeborn

1864-1932

Dr. J. A. Freeborn, prominent physician and surgeon of Fergus Falls, died at the Mayo hospital at Rochester Monday, January 25, 1932. The cause of death was cancer.

Dr. Freeborn was born in Waterloo county, Canada, in 1864, and died at the age of sixty-seven years. He was the fourth child of a large family and grew to manhood on his father's farm, attending the country school and graduating from the high school of a neighboring city in 1881. He entered a drug store at Stratford, Canada, as a clerk, and later accepted a similar position in London, Canada. In 1884, he located in Big Stone City, S. D., and opened a drug store, which he operated for two years.

He had become deeply interested in medicine and in the fall of 1886 he entered Rush Medical College in Chicago, from which he graduated in 1889. He then located at Ortonville, Minn., and practiced his chosen profession there until 1891. He then entered Bellevue Hospital and Medical College in New York City, receiving his degree from that institution a year later. He returned to Ortonville and practiced medicine there until 1896, when he came to Fergus Falls, where he had since been engaged in active practice. He was a student as well as a physician, and kept fully abreast of all the latest developments in medicine. He specialized in eye, ear, nose and throat, taking special courses in Chicago and New York and also taking X-ray work there and in Europe.

In 1891, Dr. Freeborn married Lillian Anderson, whose home was in Rochester, Minn., but who had been teaching in Ortonville. Three children were born to them: Gertrude, now Mrs. Paul Francis, of Minneapolis; Frances, now Mrs. Howard Vandersluis, of Fortress Monroe, Virginia; and Constance, now Mrs. Elmer Haugen, of Pelican Rapids.

Mrs. Freeborn died in 1915. The doctor later married Miss Agnes C. Hanson, a nurse at the Wright Hospital, Fergus Falls. During the World War, Dr. Freeborn served in the Medical Reserve corps, with the rank of captain, at Camp Custer, and his wife served as a nurse at Camp Dodge. They have one adopted son, Jack Freeborn.

Dr. Freeborn was not only an able physician, but he was highly regarded as a citizen. While quiet and unassuming, he took an active interest in public affairs, and was a member of the Rotary Club and of the executive committee of the Red Cross, and of other organizations.

Dr. John Farquahar Fulton*

1856-1932

In the passing of John F. Fulton on January 31, 1932, one of the foremost figures is lost to ophthalmology and the medical profession of the Northwest. Descending from Scotch-Irish ancestors who settled in this country about 1730, Doctor Fulton was born in York County, Pennsylvania, about fifty miles south of Philadelphia, April 20, 1856. Educated at York Collegiate Institute, he at first had leanings toward the ministry. Because of astigmatic trouble with his own eyes and consequent contact with oculists, he became interested in medicine and matriculated at the University of Pennsylvania in September, 1877. His preceptor was Dr. D. Hayes Agnew, and among the faculty during his student days were Tyson, Pepper, Horatio B. Wood, Weir Mitchell, Gross, and many other men of that day. Already possessed of a fair classical academic education, he became an excellent student of medicine and was graduated in 1880. Later Dr. Fulton was awarded the degree of Ph.D.

After an internship at the Pennsylvania Hospital and the Wills Eye and Ear Infirmary, he began practice at Altoona, Pennsylvania, then a city of 25,000, and soon established himself in general practice. Coming west to attend the A. M. A. meeting in 1882, Doctor Fulton was attracted to St. Paul and succeeded to the practice of Dr. Atwood, who was practicing ophthalmology in St. Paul and who died shortly after Doctor Fulton's arrival. He restricted his practice to ophthalmology and otolaryngology at once.

Dr. Fulton brought with him not only an excellent academic, professional, and special training but the very best traditions of medicine, and a standard of ethics toward confrères and patients which was ever a part of his naturally scrupulous and conscientious character. Thus, he soon became firmly established as the foremost ophthalmic surgeon in the Northwest during the period preceding aseptic surgery or the use of local anesthesia, and was privileged to witness the enormous evolution and development of medicine, surgical technic, and medical education during his half century of special practice. His prominence and reputation as an ophthalmologist were well deserved because of his natural aptitude, thorough medical training, outstanding personality, and conscientious devotion to his calling.

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*Committee report read before the Ramsey County Medical Society, Feb. 29, 1932.

Very early in his career, Dr. Fulton became identified with medical organization and with teaching. He was associated with Drs. Perry H. Millard, C. A. Wheaton, C. Eugene Riggs, Albert E. Senkler, Parks Ritchie, Alexander Stone and Dr. LeGrande Denslow, in organizing the old St. Paul Medical College which later merged with the Minnesota Hospital College to become the Medical College of the University of Minnesota. He was its first professor of opthalmology and otolaryngology and was emeritus professor of ophthalmology for many years preceding his death. It is reported that largely through Dr. Fulton's personal efforts, the legislature made its first large appropriation of $100,000 in support of University medical education. When the Minnesota Academy of Medicine was organized, October 15, 1887, John Fulton became its first president. He was president of the Ramsey County Medical Society in 1893 and in 1897 was elected President of the State Society. Doctor Fulton was a member of the American Ophthalmological Society, the American Academy of Ophthalmology, and the Minnesota Academy of Ophthalmology, serving at one time as president of the latter. Also, he was a member of the Ophthalmological Society of the United Kingdom.

On April 11, 1888, Doctor Fulton was married to Edith Wheaton, a sister of Doctors Charles and Robert Wheaton, prominent surgeons of St. Paul, who, with four daughters and one son, survives him. The daughters are: Mrs. Paul Judson, Oakland, California; Mrs. Harold Booraem, of Minneapolis; Mrs. Leonard Berg and Mrs. Richard Relf, of St. Paul. Dr. John F. Fulton, Jr., is professor of physiology at Yale.

Dr. Fulton was naturally congenial and popular, ever ready to sacrifice personal interests for those of his friends, his patients or his profession. These very traits resulted in sacrifice of an enormous practice, perhaps at one time the largest personal following in Minnesota. His large practice was well deserved through his ability as a clinician, his manipulative dexterity and good judgment in ophthalmic surgery and as the result of a powerful but gracious personality. His wide range of reading in medicine and current events, combined with a remarkable memory, unfailing good humor, and a fund of anecdotes made him an interesting participant in any gathering, and a worthy companion. Even during later years, Dr. Fulton was always abreast of the times and conversant with recent medical literature, often surprising younger colleagues by his thorough knowledge of the latest contributions, not only to his

(Continued on page 215)

MISCELLANEOUS

THE UNIVERSITY HEALTH SERVICE

Harold S. Diehl, M.D., Director
Minneapolis

The Students' Health Service of the University of Minnesota is an organization concerning which practically every physician in Minnesota has an opinion more or less favorable or unfavorable. Few physicians, however, know intimately or accurately of the work of this department; hence this brief report of its purposes, policies and activities.

Charles Lamb was once requested by a friend to come with him so that he might introduce him to a man standing across the room. "No, thank you," replied Lamb, "I hate that man." "But," said his friend, "you should meet him. He has many admirable qualities." "That is just why I don't want to meet him," said Lamb, "because if I should know him better I might not be able to hate him any more." This is illustrative of what happens to most physicians when they become acquainted with the work of the Health Service.

The Students' Health Service was established at the University of Minnesota twelve years ago because the administrative officers and the regents of the University felt that they had a responsibility to safeguard the health of the thousands of students who come together each year upon the campus. The service first provided was only medical attention and infirmary care. Such service to students always will remain of major importance, but in recent years more and more attention has been given to the health of students who are presumably well.

STAFF

In the past ten years, the professional staff of the Health Service has increased from one physician on full time and four on part time, to ten physicians on full time and thirty physicians and twelve dentists on part time, in addition to nurses, technicians, clerks, and stenographers. All full time physicians do some teaching in addition to their Health Service duties, while the physicians on a part time basis are engaged also in private practice. This staff is able to provide general or specialized medical service which students may need.

ACTIVITIES OF THE HEALTH SERVICE

The activities of the Health Service include the control of communicable diseases; complete physical examinations and health conferences for all students who enter the University; annual health examinations for those who desre them and as a requirement for students in the colleges of medicine, nursing, dentistry and education; clinic service for medical advice or care throughout the day and emergency service at any hour of the day or night; hospital care for students in need of hospitalization; dentistry, X-rays and laboratory service.

COMMUNICABLE DISEASE CONTROL

The control of communicable diseases in the student group depends primarily upon the early diagnosis and isolation of students with communicable diseases, the supervision of contacts and suspects, and the administration of certain immunity tests and vaccines.

HEALTH EXAMINATIONS

The health examinations, both entrance and periodic, are thoroughly and carefully performed, the student spending almost an hour with the physician, in addition to the time required for filling out the history blank, performing vision and hearing tests, taking weights and measurements, and doing laboratory work. Upon the completion of the physical examination, the physician discusses with the student his health and habits of living, and gives such advice and counsel as seems indicated, a summary of which is given to the student in the form of a health prescription. Follow-up studies to determine the significance of findings noted during these examinations are made by the Health Service in case students do not follow the suggestion that they go to their private physicians for such service.

Each year these examinations lead to the discovery of a few serious diseases and many minor defects. In the group of students who entered the University during the present school year, routine X-ray plates of the chest were taken on all students who showed positive reactions to tuberculin. These led to the diagnosis of one case of far advanced, five of moderately advanced, and nine of incipient tuberculosis. In another group of five thousand students who received periodic examinations during the past two years, ten cases of syphilis were discovered as a result of routine Wassermann tests. Each year, certain students are found to have diabetes, nephritis, or heart disease, while others who thought that they had such diseases have been assured that the diseases do not exist. Minor defects such as malnutrition, dental caries, abscessed teeth, impairments of hearing, defective vision, hernias, etc., are found in a large percentage of the students examined. As a result of these examinations, students with major illnesses are placed under treatment, and many of the minor defects are corrected. In addition, the Health conferences between physicians and students are probably the most effective means of health instruction in the University.

OUT-PATIENT SERVICE

The out-patient dispensary or clinic of the Students' Health Service makes medical service easily available at any time. In this department, students may consult physicians either in general medicine or in the various specialties. An average of about two hundred and fifty calls per day are made voluntarily by students to this department. Most of these calls are for very minor illnesses, in fact, probably not ten per cent of these students would ever reach physicians if the Health Service did not exist. The other ninety per cent would receive their medical advice from friends, landladies, or the corner drug store. Yet, it is only by encouraging students to report with illnesses which they may consider minor, that it is possible to make early diagnoses of serious illnesses or contagious diseases.

HOSPITAL CARE

To the Health Service hospital, any University student may be admitted, but the policy is to advise students who have family physicians to go home and place themselves under their care. Students living in dormitories or rooming houses are usually admitted directly to the Health Service hospital, but if the illness seems serious or if an operation becomes necessary, the student is urged to get in communication with his family or family physician and find out whether they can arrange to have this specialized service provided in one of the private hospitals of the city. Since the University makes no distinctions between students on a financial basis, it has never seemed desirable to attempt to set up economic standards for the admission of students to the Health Service hospital. On the other hand, if it is consistent with their welfare, the Health Service always urges those students who can afford to do so to secure medical service from their private physicians.

This hospital service for students, or it might better be called infirmary service, because, under ordinary conditions, very few of these students would be sent to a hospital, is of the greatest importance to students who are sick away from home. The expressions of appreciation from parents, physicians, as well as others, leaves no doubt in regard to the feelings of relief and security which parents have because of the facilities which the Health Service makes available to their sons and daughters. As I am writing this paper, forty-five students are patients in our Students' Hospital. Most of these have respiratory infections; several have had injuries; two probably have pulmonary tuberculosis; one has scarlet fever; two, broncho-pneumonia; three, gastro-enteritis; three have had operations, etc. I wonder, as I look over the list, where these students would be and what sort of care they would be receiving, if the University had not provided a Health Service to care for them. A few probably would be in hospitals; the boy with the scarlet fever, who lived in a dormitory but was isolated with a sore throat three days before the rash appeared, doubtless would be in the contagious section of the Minneapolis General Hospital, but until the rash appeared he certainly would have remained in his dormitory, exposing many other students; most of the others probably would be in bed in dormitories or in fraternity or rooming houses. What an undesirable situation that would be and how our University tolerated it as long as it did is difficult to understand. The character of the professional service and hospital care which the Health Service provides for students is such as we would wish for our own sons and daughters attending college away from home.

SPECIAL DEPARTMENTS

The pharmacy, X-ray and dental departments of the Health Service are operated on a self-supporting basis, fees being charged for the services rendered. The purpose of these departments is to provide such diagnostic, corrective and therapeutic services as are necessary to safeguard or improve the health of students.

SOURCES OF REVENUE

The entire operating budget of the Health Service comes from the students. Approximately two-thirds of the total budget is allocated to the Health Service from the incidental fees which students pay, there being no special health fee; the remainder accrues from certain fees which are collected for individual services such as X-ray, dentistry, drugs, glasses, use of the operating room, board and laundry in the hospital after two days, etc. No charges are made for professional services rendered by members of the staff.

RELATION OF HEALTH SERVICE TO PRACTICING PHYSICIANS

The Health Service desires to coöperate in every way possible with physicians engaged in the private practice of medicine. Any information which we have about the health of students, we are glad to make available to the private physicians of these students and we welcome information from physicians about students who have been under their care. Certain procedures, such as certification for athletics, military drill, physical education, teachers' certificates, etc., are responsibilities which this department must assume, but in certain cases the family physicians must have information which would be distinctly helpful in passing upon these cases. Occasionally students come to us who are under the care of private physicians. In such situations, we always desire to coöperate with the student's physician if we learn of his interest in the case.

Some physicians seem to think that the activities of the Health Service detract materially from the income of physicians in this community. Actually, however, I firmly believe that the balance is on the other side. True enough, a few physicians would receive fees from students for medical services which are now rendered by the Health Service, but the total of this amount probably would be but a small fraction of the $62,000 which the Health Service is paying this year to physicians of Minneapolis and St. Paul for service to students.

Another report occasionally heard by physicians is that the Health Service frequently operates upon students who can well afford to pay the fees of private surgeons. The facts are that, although practically all of the students who are operated upon at the Health Service are self-supporting, an occasional student who might be able to pay probably does receive a major operation here without charge. The welfare of the student, of course, must be the first responsibility of the department. On the other hand, since no fees are charged, the Health Service has nothing to gain by the performance of operations and no member of the staff wishes to assume responsibility which he can properly pass on to someone else; furthermore, it is our desire to coöperate and not compete with physicians and surgeons in practice. These are the reasons for our policy of referring students with major illnesses to private physicians whenever possible.

Important as such immediate relationships of this service seem to be to the practice of medicine, the remote results of this work, we believe, contain infinitely greater possibilities, and all of these tend as the of benefit to the medical profession as well as the public. The medical experience and health education which some six thousand students are unconsciously receiving each year from thorough physical examinations and health conferences, the custom of an annual physical examination which hundreds of students practice and the habit of seeking medical service promptly when ill, which most of the twelve thousand students learn while here, cannot fail to exert a very real and favorable influence upon the subsequent health and medical practices of these young men and women. Certainly most of these students leave the University with a better understanding of modern medicine than they ever had before and they no longer will be satisfied with slipshod medical practice or superficial physical examinations. Charlatans and quacks will have but little chance of ever selling their particular brand of therapeutics to these students.

In conclusion, I should like to state that I believe that every activity of the Health Service is fully justified, that physicians of this community receive more income through the Health Service than they would from the student body if the Health Service did not exist, that the end-results of this work will react greatly to the advantage of both the public and the medical profession; and finally, that the Health Service always considers it a privilege to hear from and coöperate with family or private physicians in the proper care of students attending the University.

MOST GOVERNMENTS ARE INEFFICIENT OR CORRUPT—SOME ARE BOTH*

EDWARD H. OCHSNER, M.D.
Chicago, Illinois

One of the very first questions that naturally arises is: Have any of our governmental agencies so conducted themselves in the past as to make it reasonably safe for us to entrust so stupendous a function as universal social insurance to any branch or department? I maintain that most of our local as well as state governments are inefficient or corrupt, and some are both.

Let any one who doubts the correctness of this statement spend a little time to look around with a critical eye and observe how most local governments, the various departments of the state in which he lives, and the departments of the federal government are conducted, and I am convinced that he will find more inefficiency than he has ever dreamed could exist. If he does not personally know of corruption and inefficiency in government, let him but scan one single daily newspaper regularly for a month in order to be convinced. And what else can one expect who is at all familiar with politics as it has been played and managed in these United States in the year 1931—the manner in which most men secure their nominations and later their elections, and to whom they are beholden when they take office?

We have all seen the statement repeatedly in the public press, but have never seen it successfully refuted, that in many of the political subdivisions of our country only sixty per cent of the taxes collected are effectively spent, the remainder being frittered away, wasted or stolen. This inefficiency and corruption is due to many causes, of which some of the more important are:

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*One of a series of articles appearing in state medical journals on various phases of socialized medicine.

The fact that so far no formula has been discovered according to which the most efficient, honest, industrious and worthy members of the community can be secured for public office. Nor has there been any method devised whereby spoils, politics, favoritism, pull, nepotism, waste and graft can be eliminated with even a reasonable degree of certainty. The individual who could solve these two problems would not only be the greatest benefactor of the human race but the wisest man the world has so far produced. Plato tried to solve this problem twenty-three centuries ago when he wrote his Republic. For a time he actually thought he had found a solution. He prevailed upon the King of Syracuse to adopt his plan and put it into operation. The King tried it for a while, tired of it and sold Plato into slavery. Some good friends ransomed him. After that he was not so sure that his scheme would work in practice. Things are not much different today than they were in the time of Plato—only worse. Worse because of the increase in population, resulting in larger governmental units, the enormous increase in the number of those exercising the franchise, the increase in the percentage number of ignorant voters and the ever increasing astuteness and finesse of our practical politicians.

Inefficiency and corruption is so common that we have become callous to it. We are annoyed by it, we grumble and complain mildly about it, we pay our ever mounting taxes if we have anything with which to pay and "let it go at that." It almost seems as though we humans had adopted David Harum's dog philosophy and were applying it to ourselves. He said:

"A certain amount of fleas is good for a dog, it keeps him from brooding on being a dog."

The best illustration of governmental muddling in general is to be found in the mess most governments of the world have made of themselves during the past twenty years. As examples, we need but call attention to the virtual bankruptcy of Germany and of Austria, the maladministration in Russia, the revolutions in Spain, China, Central and South America, the dictatorships in Poland and Italy, and, when we come nearer home, the general lawlessness in the United States with its murders and kidnapping for ransom; conditions in the city of New York as diclosed by the Seabury Investigation; the virtual bankruptcy of Chicago and Philadelphia, and the near bankruptcy of many other governmental units.

Let us study conditions in our own country a little more in detail in order to determine whether it would be wise or even safe to entrust the federal, state and local government, or any one of them, with supervision over the private lives of its citizens. (This phase of the problem will be taken up more in detail in the future installments.)

NOTE ON MIGRAINE

E. C. Hartley, M.D.
Saint Paul

Clendening* refers to a number of writers who comment upon duodenal and upper intestinal tract stasis during attacks of migraine. He himself says: "This condition of stasis, however, has long been known and the feeling is peculiar to all sufferers of the disease. A fair proportion of them know that if they get a cathartic, or some analgesic drug such as aspirin, in the stomach during the prodromal stage they may abort an attack, but if they wait until this attack is in full swing, any medicine which is swallowed will stay in the stomach and later be vomited. Translating these clinical facts into physiologic language, it means that if the drug is taken before the gastrointestinal stasis occurs, then it will be moved into the intestines and absorbed and thus have some action, but if taken later when the gastric and intestinal musculature is paralyzed, no absorption occurs."

Obviously, any symptom which appears early enough to mark the point at which medication could be taken early enough to insure its absorption will be of primary value in effective treatment. The writer (whose chief interest in migraine is the fact that he has felt its cyclic visits with considerable gloom) has identified one symptom which satisfactorily marks this point in himself; upon inquiry among friends similarly afflicted, the same symptom was recognized.

This symptom, marking the point at which oral medication may be taken with a reasonable hope of relief, is a sensation of gagging; the patient makes efforts to clear his throat, not violently or excessively, but still definitely enough so that he will recall the sensation if asked about it, but, as a rule, not otherwise. Once recognized the patient must not delay taking his medicine, for gastric inertia invariably sets in within a short time and the attack will run its customary course.

Calcium in various forms has been used for some time in the treatment of migraine. The writer has found that calcium gluconate, one or two heaping teaspoonfuls in water, will uniformly abort an attack. All that is felt is a sensation of tiredness, not unpleasant; there is no nausea, vomiting, depression or headache.

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*Clendening: Modern Methods of Treatment. 4th Edition. C. V. Mosby Co.

THE BACTERIOLOGY OF LISTERINE OR WAS THE LANCET REPORT RELIABLE?

According to the Lancet (London) report: "The actual number of micro-organisms killed in 15 seconds by undiluted antiseptic exceeds that claimed by manufacturer," that is, 200,000,000 in 15 seconds. Such a statement means little. The Lancet report *does not* bring out what the A. M. A. report does: diluted Listerine is no more bactericidal than water. Even full-strength Listerine is an exceedingly weak germicide. (Jour. A. M. A., November 14, 1931, p. 1467.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of March will be as follows:

March 2—Personal Hygiene—Fresh Air and Sunshine.

March 9 —Cleft Lip and Palate.

March 16—Prevention of Bronchiectasis.

March 23—Fracture of the Spine.

March 30—How Does Cancer Begin?

AMERICAN COLLEGE OF PHYSICIANS

The sixteenth annual Clinical Session of the American College of Physicians will be held in San Francisco the week of April 4, 1932.

The program will include some sixty addresses covering the more recent advances in the field of internal medicine. Among other medical subjects which will be discussed will be the following: hypertension, pulmonary arteriosclerosis, edema, leukopenia, arthritis, and diseases peculiar to the West Coast. The recent outstanding progress in our knowledge of the involuntary nervous system will be presented.

Clinics in the various local institutions will occupy the morning hours. History of medicine which has received growing interest of late will occupy one of the morning sessions.

While the session is intended for Fellows and Associates of the College, an invitation is extended to all physicians to attend. The guest fee of $15.00 includes a year's subscription to the Annals of Internal Medicine in which the papers will be published. General practitioners as well as internists will find the meeting profitable.

Dr. S. Marx White, Minneapolis, is the incumbent president and Dr. George Morris Piersol, Philadelphia, the general secretary.

MINNESOTA STATE MEETING

Technical exhibits will be the center of interest during a large share of program time at the 1932 meeting of the Minnesota State Medical Association and the Minnesota State Hospital Association scheduled for May 23, 24 and 25 at the new St. Paul Auditorium.

This will be the largest joint meeting of medical and hospital personnel ever gathered in the Northwest. Representatives of eight states, including Montana North and South Dakota, Nebraska, Wisconsin, Iowa, Wyoming and the Winnipeg Medical Society of Manitoba, Canada, have already indicated an intention to attend.

The enlarged scope of this meeting which, in its scientific and technical exhibits and its demonstrations as well as in one large joint evening meeting takes in both great associations, has occasioned a number of program departures.

One special feature of the 1932 arrangement calls for two one hour sessions each day and an open Monday evening session in the technical exhibit hall. This is for the especial purpose of giving every visitor a chance to examine all exhibits. The most interesting program novelty will undoubtedly be the forty table demonstrations to be held during the two one hour exhibit hall sessions. These demonstrations are to be sufficiently varied in subject to interest everybody, and those who are not attending the demonstrations may take advantage of the time to study the scientific and technical exhibits. These last are to be especially emphasized at this meeting.

Twice daily the demonstrations will be conducted from 10:00 to 11:00 A.M., and from 2:00 to 3:00 P.M., by twenty of the best qualified men in the state. The Committee on Clinical Demonstrations and Exhibits announces that it is taking every care to guard against any repetitions or overlapping in subjects. Among those selected to date are: Fungi; the Ascheim-Zondek Test; the Electrocardiograph; Undulant Fever; the Allergic Skin Test; Urine Typing of Pneumonia; X-ray of Juvenile Tuberculosis; Gallbladder Technic; the Tuberculin Skin Test; Cauterizing the Cervix; Brain Model; Localization; Ulcer X-ray; Eyegrounds; Fracture Demonstration. Final choice of those who are to give the demonstrations will be made at the February meeting of the Committee on Scientific Assembly.

Both scientific and technical exhibits will have the benefit of the unusual space and presentation facilities of the new Auditorium. The committee in charge already reports an unusual number of entries. The gold medal for the best scientific exhibit will be offered again for the third consecutive year by the Southern Minnesota Medical Association. This medal was won in 1930 by Dr. Leo Rigler, University of Minnesota, and in 1931 by Dr. William P. Herbst of Minneapolis and Dr. R. K. Ghormley of Rochester. Competition is expected to be keen in 1932 for this medal.

A series of six clinical pathological and clinical radiological conferences has been arranged as another 1932 novelty for the Monday afternoon program. Drs. E. L. Tuohy of Duluth, Harold Robertson of Rochester, John Noble of St. Paul, B. R. Kirklin of Rochester, and Leo Rigler have already been assigned to conduct the conferences, each of which will occupy forty minutes of program time.

Hospitalization and Medical Care of Veterans will be discussed before a large joint meeting of the hospital and medical associations Monday night in the theater of the Auditorium. Speakers for this meeting which is to represent hospital men, the medical profession and lay trustees of hospital boards include the Reverend Father Alphonse Schwitilla, president of the Catholic Hospital Association; Mr. F. R. Bigelow, president of the St. Paul Fire and Marine Insurance Company; Mr. E. V. Cliff, Ortonville, National Executive Committee member of the American Legion; and, if his engagements permit, Dr. Olin West, secretary of the American Medical Association, Chicago.

IOWA STATE MEDICAL MEETING

The members of the Minnesota State Medical Association are cordially invited to attend the annual session of the Iowa State Medical Society, to be held in Sioux City, Iowa, May 4, 5 and 6. The program, which is an especially strong and interesting one, begins at 8:00 a. m. on Wednesday, May 4, and concludes at noon on Friday, May 6. There will be an hour and a half of medical and surgical clinics, and symposia upon the following subjects are included in the program: kidney, blood diseases, neurological conditions, cancer, and pediatrics.

Presentation of a membership card in the Minnesota State Medical Association will admit any physician from this state to full privileges in all scientific sessions.

MINNESOTA RADIOLOGICAL SOCIETY

At the winter meeting of the Minnesota Radiological Society, held at the University Hospital in Minneapolis on Saturday, February 13, 1932, the following program was presented:

CLINICAL-PATHOLOGICAL-RADIOLOGICAL CONFERENCE

Conducted by Dr. W. A. O'Brien

Assisted by Drs. B. Pearson, O. Randall, R. Koucky

1. Ewing's Sarcoma of Bones
   Discussion by Drs. W. Cole, C. Hansen
2. Multiple Myeloma with Intestinal Obstruction
   Discussion by Dr. O. H. Wangensteen
3. Carcinoma of Breast with Multiple Metastases
   Discussion by Drs. K. Stenstrom, O. Campbell, L. Rigler
4. Carcinoma of Antrum with Peripheral Metastases
   Discussion by Drs. W. Peyton, K. Stenstrom

Relative Value of Stereoscopic and Single Films in the Routine Examination of the Chest—Dr. Frederick B. Exner

Studies on the Routine Examination of the Chest in Students—Dr. Harold Diehl

Anomalous Lobes of the Lungs—Dr. L. G. Erickson

Observations on Intra-pleural Pressure in Massive Pulmonary Atelectasis—Dr. Rudolph Kocky

Radiation Therapy of Neuritis—Dr. John J. Eneboe

Fractures of the Sesamoids—Dr. Jacob Sagel

Methods of Radiation Therapy of Carcinoma of the Esophagus—Dr. C. O. Hansen

Intraperitoneal Herniæ, Preliminary Report—Dr. Frederick Exner

The Use of Thorotrast in Roentgen Diagnosis, Preliminary Report—Dr. L. G. Ericksen

ADDRESSES

The Recent Literature on the Classification and Treatment of Bone Tumors—Dr. W. A. O'Brien, Professor of Pathology, University of Minnesota

Cholecystographic Studies on the Emptying of the Human Gall Bladder—Dr. E. S. Boyden, Professor of Anatomy, University of Minnesota

The next meeting of the Society will be held in Saint Paul, May 23, 1932.

RICE COUNTY SOCIETY

The Rice County Medical Society met February 12, at the Blue Bird Inn at Faribault as guests of Dr. and Mrs. D. W. Francis. The affair was given in honor of Captain O. T. Francis, U. S. M. C., brother of Dr. Francis, who has been in command of the government radio station in Shanghai for the past two years.

Mr. Lester Swanberg reviewed recent news from the Far East, and Captain Francis talked about China.

Dr. C. W. Plonske, secretary-treasurer, presented his annual report showing 100 per cent membership in the society and a balance of $115.29 in the society treasury.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

WEST CENTRAL MEDICAL AUXILIARY

The mid-winter meeting of the West Central Medical Auxiliary was held at the Merchants' Hotel at Morris, January 13. The program included an explanation of the Shoulders Bill, given by Mrs. Herman Linde of Cyrus. Two new members, brides of this fall, joined the Auxiliary.

HENNEPIN COUNTY MEDICAL AUXILIARY

At the January meeting the Woman's Auxiliary of the Hennepin County Medical Society voted a three hundred dollar student loan fund for medical students at the University of Minnesota, this fund to be administered by the Dean of the University. Dean E. E. Nicholson of the University came to the meeting and explained the method of handling such funds. At this meeting Mrs. Walter Marcley gave a very interesting talk on international relations, with some discussion of the disarmament conference.

RAMSEY COUNTY MEDICAL AUXILIARY

To raise money for their Student Loan Fund, the Ramsey County Medical Auxiliary held a card party, Friday, February 5, in the County Society rooms.

The members are busy making arrangements for the coming State meeting to be held in Saint Paul in May.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of Dec. 9, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 9, 1931. Dinner was served at 7 o'clock, and the meeting was called to order at 8 o'clock by the President, Dr. J. S. Gilfillan.

There were 47 members and 1 guest present.

Minutes of the November meeting were read by the Secretary and approved as read.

The annual election of officers was held, resulting as follows:

President, Dr. J. C. Litzenberg, Minneapolis.
Vice President, Dr. C. D. Freeman, St. Paul.
Secretary-Treasurer, Dr. R. T. LaVake (re-elected).

The scientific program of the evening was as follows:

Dr. A. E. Wilcox (Minneapolis) reported a case of "Traumatic Subcapsular Hemorrhagic Cyst of the Spleen" as follows:

The patient, H. H., age 26, reported July 31, 1931, complaining of pain in the upper left quadrant along the costal margin.

His immediate history was that in the morning of the above date he was carrying a crate of machinery and struck his left side against the edge of a table. His symptoms did not seem to be severe; in fact, he came for observation at the insistence of his employer and not on account of the severity of his symptoms. Physical and X-ray examinations were negative and the condition was considered of a trivial nature and diagnosed as a contusion of this area. He continued to work, but reported at the office five times the following month, during which time he was still at work, but complained periodically of some pain in his side.

On September 14, 1931, in the evening, he noticed for the first time a swelling below the left costal margin and the pain increased. The following day he reported at the office, at which time a palpable swelling was noted occupying a position below the left costal region. The swelling appeared to be four or five inches in diameter and the mass was tender and marked friction rub was noted on deep breathing and definite dullness on percussion. The mass was smooth and round, but gave to the palpating hand the sense of fluctuation. The clinical impression was enlarged spleen.

X-ray studies were made and the report was as follows: "Fluoroscopic examination was made of the stomach and duodenum following the ingestion of a barium meal. The stomach is displaced markedly towards the right so that it lies almost in the midline with also marked displacement anteriorly by a mass which bulges in the left upper quadrant and which apparently also causes a splinting and elevation of the left diaphragm. The stomach and duodenum otherwise are normal. Films were made of the abdomen with the barium-filled stomach. The marked displacement of the stomach is again demonstrated. The mass occupies the entire left half of the abdomen with the stomach displaced well beyond the midline. The kidney shadow can be fairly well made out although it does appear to be somewhat enlarged. The shadow of the psoas muscle can also be differentiated, but is somewhat overshadowed by the abdominal mass. The nature of the mass can not be further determined. Its location and possible association with trauma would indicate that it represents a retroperitoneal hemorrhagic cyst. This type of appearance is occasionally associated with a large hydronephrosis so that the process may be in the perirenal region. I do not think it arises in the spleen. At 24 hours the transverse colon shows marked downward displacement including the splenic flexure. The entire study most strongly suggests a retroperitoneal mass.

"Conclusions:

1. Large left abdominal mass.
    a. Possible retroperitoneal hemorrhagic cyst with or without involvement of the kidney capsule.
    b. Possible large hydronephrosis.

"Films were made of the region of the kidneys. The right kidney is entirely within normal limits. The left kidney appears to be definitely enlarged and its outline fuses with the large mass palpable in this region from which its contours can not be separated. These films show some obliteration of the psoas shadow, but there is no evidence of spasm of the psoas muscle. This study suggests the same conclusions as on the previous examination and most strongly indicates a kidney mass."

On September 17, 1931, the patient was admitted to the hospital. Temperature was normal, pulse 85, respiration 18. Urine was negative. Hemoglobin 70 per cent. Erythrocytes 4,156,000, leukocytes 10,800, P. M. N's 70 per cent, large lymphocytes 18 per cent, small lymphocytes 12 per cent. Other general physical examination appeared to be negative and unimportant.

Revised pre-operative diagnoses were:

1. Hemorrhagic cyst of spleen, traumatic.
2. Retroperitoneal hemorrhage.
3. Hydronephrosis.

An exploration was advised. Under spinal anesthesia, 200 mg. novocaine, supplemented with nitrous oxide, a left rectus incision was made. When the peritoneum was opened a large, smooth, cystic tumor which proved to be the spleen was found. The spleen grossly appeared about the size of an adult's head. There were marked adhesions to the anterior peritoneal wall, diaphragm, omentum, and stomach. These adhesions were carefully separated and with considerable difficulty, and this only after rupturing of the capsule and allowing some of the encysted fluid to escape. The pedicle of the spleen was gradually isolated and ligated in sections with chromic catgut, being careful to avoid important surrounding structures, mainly the tail of the pancreas and stomach. Some of the adhesions bled sufficiently to warrant ligation of the stumps, but in general the field was fairly dry when enucleation was completed. The abdominal wound was closed in tier sutures without drainage, no other pathology having been encountered.

The post-operative period was uneventful and, with the exception of hypodermoclysis and sedative for pain, no difficulties were encountered. Wound healed by first intention. Patient left the hospital, October 1, 1931, and returned to work November 9, apparently free from symptoms.

The specimen presented shows a spleen weighing 360 grams, after the fluid was removed. Before the capsule was ruptured, as stated above, the appearance was about the size of an adult's head and undoubtedly contained approximately two quarts of fluid. The capsule is markedly thickened and shows evidence of marked adhesions.

Final impressions were that there had been a contusion of the spleen followed by slow, progressive hemorrhage or that there had been a secondary hemorrhage which accentuated his symptoms at this late date. However, the thickened capsule would suggest that the affair had been slowly progressive from the start.

The patient was of the tall and markedly asthenic type, in which the spleen may occupy a position below the costal margin, making exposure and susceptibilty to trauma more marked.

DISCUSSION

Dr. F. E. B. Foley (St. Paul): In the first place I would like to congratulate Dr. Wilcox on two points: first, on the presentation of such an unusual case, and second, on having put the spleen first in the order of possible diagnoses.

I am interested particularly from the standpoint of the differential diagnosis between the condition found by Dr. Wilcox and a process in or about the kidney.

His remarks concerning the roentgenologic examination of the kidney are worthy of some comment. It is said that accumulations around the kidney obliterate the psoas shadow. In twenty-five or thirty cases of perinephric abscess which I have observed, the psoas shadow was obliterated almost regularly. On the other hand the psoas shadow may be obliterated in the absence of perinephric abscess, inflammation or hemorrhage. Any process that gives an increased density over the psoas border, such as hydronephrosis, renal tumor or solitary cyst, may obliterate the psoas shadow. Finally the psoas outline may fail to show even in good films in the absence of any pathologic process whatever. For these many reasons the sign is of dubious value and not to be relied upon.

The really valuable criterion in differential diagnosis would be a pyelogram. I did not understand that a pyelogram had been made in this case and without one I rather marvel at Dr. Wilcox's diagnostic acumen in having recognized this as a tumor of the spleen.

Dr. Irvine McQuarrie (Minneapolis) read his Inaugural Thesis entitled, "Some Recent Observations Regarding the Nature and Treatment of Epilepsy in Children."

I wish to thank the Academy for the honor of my election to membership. It is a pleasure for one to belong to a group such as this, which is composed of men representing all branches of medicine and surgery.

ABSTRACT

The results of some recent studies on the blood lipids and on the mineral and water exchanges in epileptic children were presented. It was shown that under certain conditions cessation of grand mal seizures in severely epileptic children follows the establishment of a deficit in the body water, whereas rehydration rather promptly leads to their recurrence. Data were presented to show that typical seizures can be induced at will in a high percentage of mildly epileptic patients during their usual intervals of freedom from attacks and while they are on relatively high water and low mineral intake by sustained pituitary antidiuresis. Convulsions usually occur under these conditions only after the amount of water retained is equal to from two to five per cent of the body weight. That dilution of the extracellular body fluids under these conditions is an important factor in the induction of seizures is indicated by the fact that a low mineral intake favors their occurrence, whereas ingestion of just sufficient NaCl to prevent dilution tends to interfere with the reaction.

In one case of severe epilepsy in which seizures were temporarily under control as a result of the dehydration regimen, rehydration was repeatedly found to be accompanied by both a relative and an absolute increase in the excretion of potassium. A reversal of the urinary potassium to sodium ratio regularly appeared even before the seizures occurred. Pituitary antidiuresis accentuated this reaction, whereas luminal had an opposite effect.

While studies on the blood lipids revealed no clear-cut relationship between the occurrence of seizures and the absolute level of either cholsterol or lecithin, they definitely indicated that the lecithin to cholesterol ratio tends to be highest in samples taken nearest to the time of seizures. These data, together with the foregoing, were tentatively interpreted as suggesting that there is an inherent defect in the mechanism for controlling the permeability of the brain cell membranes in epilepsy. Therapeutic implications from such an interpretation were discussed. The circumstance that most of the conditions which favor the occurrence of seizures, such as alkalosis, anoxemia, superhydration and excitation, are likewise known to increase cell membrane permeability, and that factors which prevent them, such as sedation and narcosis, cause decrease in permeability, lends support to this general thesis.

DISCUSSION

Dr. E. M. Hammes (St. Paul): Doctor McQuarrie has presented this interesting experimental work on epilepsy in a most fascinating way. The more I hear about the theories on the etiologic factors in essential epilepsy, the more confused I become.

When Temple Fay brought forth his dehydration treatment, because of increased spinal fluid findings in epilepsy, we felt that at least an important mechanical factor had been solved in this very obscure problem. However, there are many clinical experiences which are difficult to explain on any of these theories. It is a well known fact that an epileptic will be free from convulsions for months and months following some surgical procedure, regardless of what or where the operation was, and then have a recurrence of his convulsions without any apparent cause. Reed of Cincinnati demonstrated that in a large number of epileptics, in whom he removed the colon without obtaining any permanent results.

Furthermore, epileptics frequently have a complete cessation of convulsions for months with or without treatment, and then suddenly develop a status epilepticus.

It is difficult to explain these facts with any theory that has been suggested. I would like to ask Doctor McQuarrie if his experimental work was limited solely to cases of grand mal, or if some studies have been made in cases where the convulsions were only of the petit mal type.

Dr. J. C. McKinley (Minneapolis): I should like to ask Dr. McQuarrie how far he would go in applying his ideas on the etiology of the so-called essential epilepsy to symptomatic epilepsy, that is to epilepsy secondary to tumors, meningeal inflammations, and things of that sort.

We are to be complimented in having such work as this going on in our community. Whether or not we agree that Dr. McQuarrie has uncovered the true etiologic factors is wholly aside from the question. He is showing us some phenomena of fundamental importance that are going on in our epileptics and is giving us at least a working hypothesis until sufficient facts can be accumulated to round out our conception of the disease.

Dr. McQuarrie (in closing): Petit mal cases do not seem to behave exactly like the others. So far we have confined our study chiefly to cases predominantly of the grand mal type. In the former a typical attack may occur while the nurse is out of the room for a moment and so may go unobserved, but if a patient has a grand mal seizure no doubt exists regarding its occurrence. I am under the impression that the mechanism is somewhat different in these two convulsive reactions. The patients upon whom the effects of the special therapeutic regimen were studied were chiefly those having many convulsions daily because it is from these alone that one is justified in drawing conclusions unless very long periods of observations are used. What occasionally occurs when a severely epileptic patient is placed upon a forced fluid regimen is a washing out of minerals with a resulting net loss in body water. This effect may be responsible for the decrease in the number of seizures. When water is stored under similar conditions convulsions are likely to recur.

It is true that in occasional instances patients stop having seizures after undergoing operative procedures of various sorts. On the other hand, if one expects such a result with any degree of frequency one is likely to be disappointed. The multiplicity of minor factors which apparently influence the course of this disease cannot be explained until more has been learned regarding its underlying pathological physiology. The permeability of the living cell membrane is not constant, but is known to vary in degree from time to time, probably in accordance with the state of nutrition of the cell, its oxygen supply, the PH of its environment, etc. It is possible that some of the minor provocative factors, such as fright or reflex irritation from certain pathological lesions, influence brain cell permeability in the direction favoring the occurrence of convulsions.

In regard to Dr. McKinley's discussion, he knows much more about that than I do, I am sure. I have no explanation of the fact that some persons have convulsions from head injuries. It is said that epilepsy developed in but 5.4 per cent of the cases of head injury during the war. Since the incidence of epilepsy in the general population is around 0.4 per cent there must be many more persons who have the characteristic underlying defect in their nervous makeup but who do not have convulsions until they have some brain injury. It is difficult to explain on any other ground the fact that a given circumscribed lesion, such as a brain tumor, abscess or traumatic scar, appears to cause seizures in but a minority of cases.

Dr. F. E. B. Foley (St. Paul) gave a lantern slide talk on "The Embryology and Surgical Correction of Certain Renal Malformations" and reported three cases of horseshoe kidney operated.

Dr. E. A. Boyden of the Department of Anatomy at the University of Minnesota discussed the embryological development of anomalies of the kidney.

The meeting adjourned.

R. T. LaVake, M.D., *Secretary.*

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of January 7, 1932

The regular monthly meeting of the Minneapolis Surgical Society was held in the Lounge on the 30th floor of the Medical Arts Building on Thursday evening, January 7, 1932.

The meeting was called to order at 8 P. M. by the President, Dr. J. Frank Corbett. There were 31 members and 6 visitors present.

The following scientific program was presented.

Dr. E. A. Regnier reported a case of "Acute Pancreatitis Secondary to Common Duct Obstruction" as follows:

Mr. S. S., age 35, No. 8582, was admitted to General Hospital on surgery service on September 5, 1931, at 8:00 P. M. He complained of severe pain in the epigastrium, with nausea and vomiting. The patient was well until 8:30 A. M. on the day of his admittance. At 8:30 A. M., while cranking his car, he was suddenly seized with a severe pain in the epigastrium. He collapsed. The pain remained until 11:00 A. M., but eased up about this time. About one hour later the pain returned with increased severity and he vomited many times. He called a doctor, who gave him morphin and sent him to the hospital.

His past history is negative except for vague gastrointestinal distress during the past two years. He had had gallbladder studies a year ago in Chicago but was told that he had no gallbladder disease.

Physical examination reveals a very acutely ill patient. There was no jaundice; temperature 101.4°, pulse 116, respiration 34, blood pressure 124/72. The pupils were equal and regular. There was much dental caries. No abnormal adenopathy. Heart and lungs were normal. He showed boardlike rigidity over the entire abdomen. Palpation over any portion of the abdomen seemed to increase the pain in the epigastrium. There were no masses felt. Rectal examination was negative. W.B.C. 23,000. P.m.n.'s 93%. Urine negative.

Diagnostic impression: perforated ulcer, pancreatitis.

Operation: Under spinal anesthesia the abdomen was opened through the upper right rectus incision. There was a copious quantity of bile-stained fluid in the abdomen. The stomach and duodenum were normal. There were numerous areas of fat necrosis about the peritoneum and the mesenteries of the intestine. There was an extreme degree of edema of the pancreas and surrounding tissues. There was no hemorrhagic exudate. The gallbladder was tense and slightly thickened. There was a hard mass, palpable, in the region of the common bile duct. The duct was incised and several stones ranging from ½ to one cm. were removed. The stones were faceted. A "T" tube was inserted in the common duct for drainage. The gallbladder was opened and a great many stones were removed. The gallbladder was closed and left in place. A Penrose drain was inserted down into the foramen of Winslow.

Postoperative diagnosis: (1) common duct obstruction; (2) acute pancreatitis with fat necrosis; (3) gall stones; (4) chronic cholecystitis.

The immediate postoperative condition was quite stormy. The patient had typical postoperative asthenia as described by Whipple. He was given daily intravenous injections of glucose and after about ten days he began to improve quite readily. The "T" tube was removed the third week following the operation. The patient was discharged from the hospital on October 16, 1931, at which time the wound was practically healed. It is now four months since the operation and the patient has gained 35 pounds in weight.

Dr. Robert Schwyzer read his Inaugural Thesis, entitled "Pancreatitis, with Report of Cases."

ABSTRACT

A case of acute pancreatitis with fat necrosis and sanguinolent exudate in the peritoneal cavity is presented. It is interesting because its onset was not as stormy as usual and was not preceded by a history of gallbladder disease. The biliary system at operation was found to be normal. Simple drainage of the lower cavity was done and the patient recovered.

In the discussion of *etiology* the various factors, such as obstruction of the pancreatic duct, regurgitation of bile and extension through the lymphatics, are considered; laying stress on the fact that acute pancreatitis may follow many infections in the body, and especially epidemic parotitis.

The *symptomatology* is studied of 382 cases collected from the literature of the last ten years. Females prevail with 65 per cent. Biliary disease was present in 71 per cent, occlusion by stone in none. Pain was found constantly, mostly located in the epigastrium, postprandial in cases accompanied by gallbladder. Tenderness, pathognomic when localized in left hypochondrium, was absent in a few cases. Rigidity is never very marked. Vomiting occurs in nearly 100 per cent and is described as incessant. Cyanosis and shock, important in the differential diagnosis, were present only in about 40 per cent of the cases. The prognosis of these is bad. Icterus was found in 30 per cent. Pulse and temperature are variable. Kidney function is often impaired; glycosuria and hyperglycemia are rare.

Leukocyte count increased, relative increase of the polynuclear not characteristic. Increase of diastase in the blood is of no value, while increase of diastase in the urine to 250 units or more is of help in the differential diagnosis, but failures up to 20 per cent of cases have to be considered.

Pathology varies from edema to destruction of the gland. Fat necrosis is mostly present, the exudate in 72 per cent. This is primarily mostly sterile.

Complications: cyst, abscess, extension of fat necrosis to pleura, embolic abscesses of the liver.

Difficulty in exact differential diagnosis.

Extent of surgery depends on findings; biliary surgery only in light cases, in late cases drainage of gland.

Postoperative complications; arrosion of skin and fistula, hemorrhage.

Sequelæ: asthenia, diabetes, and chronic pancreatitis.

Recurrences: not uncommon, especially in cases complicated by gallstones.

Mortality: 55 per cent for all cases. Less in cases with edema of gland only, greater when necrosis is present. In exudate cases, prognosis worse.

Early operation treatment of choice despite publication of Mikkelson, only 7 out of his 50 cases proven by biopsy or autopsy.

Comment: Prevention is increased by early biliary surgery. Cases operated on early give better prognosis. Limited surgery indicated in cases with peritonitis. Intervention preferable to conservatism.

Dr. O. H. Wangensteen gave a paper on "Acute Pancreatic Necrosis with Comments on Diagnosis and Therapy" (to be published elsewhere).

ABSTRACT

Dr. Wangensteen stated that he would like to preface his remarks by stating that no one is infallible in the differential diagnosis of acute disasters of the abdomen. It was his impression, until some years ago, that acute pancreatitis was heralded by the appearance of shock, a rapid pulse, and cyanosis. Six years ago he saw his first clinical case of acute pancreatic necrosis. It concerned a woman aged 39, the mother of four children. She complained of diffuse severe abdominal pain and gave a history of several attacks of upper right quadrant pain that seemed to be best interpreted as attacks of gallbladder disease. The pulse in this attack was 90, the temperature 100.4° F., and the blood pressure was normal. The pain was severe, but the patient did not look especially ill. On examination of the abdomen, tenderness and rigidity about 2+ were found to be present everywhere. There was no greater rigidity in the region of the gallbladder than elsewhere. Rectal and pelvic examination was negative. A diagnosis of acute cholecystitis (probably empyema) with threatening inundation of the peritoneal cavity was made, though this diagnosis was not satisfactory in the absence of greater rigidity over the upper rectus muscle. At operation, performed under a combination of local infiltration and nitrous oxide anesthesia, the correct diagnosis of acute pancreatic necrosis was established on entry of the peritoneal cavity by the presence of fat necrosis and an abundant brownish sanguinous fluid. The peritoneal cavity was drained, as was the gallbladder, several gall stones being simultaneously removed. The pancreas was found to be soft and fiery red; its capsule was split and large gauze tampons were led down to the pancreas through both the gastro-hepatic and gastro-colic ligaments. The next morning the patient's condition was fair, though the blood pressure was somewhat depressed and slight cyanosis of the finger tips was present. About sixteen hours after operation she presented the classical text-book picture of acute pancreatitis. She was deeply cyanosed and shock was extreme. There was blood in the vomitus and in the urine. Necropsy examination showed hemorrhages in the intestinal canal, the lungs, kidneys, and other tissues. Undoubtedly there was trypsin in the blood stream.

About a year later, another patient, presenting the same picture as detailed in the above case record, was seen. There was but slight elevation of the pulse, and moderate temperature rise. The patient complained of severe abdominal pain and physical examination revealed diffuse abdominal tenderness and rigidity of about 2+ to 3. A diagnosis of acute pancreatic necrosis was made and confirmed at operation. The same operative procedure was performed as in the first case, with the same outcome.

To date, four patients, Dr. Wangensteen stated, have been operated upon with the same outcome in each instance. Two of these survived for as long as sixteen days.

In April, 1931, a woman, aged 33, was observed at the University Hospital presenting the picture outlined above. A diagnosis of acute pancreatic necrosis was made and conservative therapy carried out. Somewhat more than three weeks later, at which time all of the abdominal symptoms had subsided and the patient was ambulant and eating well again, exploration was done. Many areas of fat necrosis as large as the thumb nail were still scattered throughout the upper abdomen. The gallbladder contained numerous stones and was excised. The patient convalesced uneventfully and has remained well. The instance of an adult male was then related in which a diagnosis of acute pancreatic necrosis was also made and delayed operation performed about a month later. Scattered areas of fat necrosis were still present throughout the mesenteries and a small mass was palpable in the mid-portion of the pancreas. The gallbladder was excised; it contained no stones, but a microscopic diagnosis of cholesterosis was made by the pathologist. The patient had a smooth convalescence and has remained well.

The conditions that must be differentiated from acute pancreatic necrosis, Dr. Wangensteen stated, were (1) acute appendicitis with peritonitis, (2) twisted ovarian cyst, (3) acute bowel obstruction, especially strangulation types of obstruction, (4) acute lesions of the gallbladder, (5) perforation of a duodenal or gastric ulcer.

Perforation of a hollow viscus in the upper reaches of the intestinal canal, Dr. Wangensteen went on, are heralded by a board-like rigidity of the abdomen. There is usually, however, no shock in the true sense for the pulse and blood pressure are usually normal despite the apparent prostration of the patient. The sudden onset and collapse of the patient may be very much the same in both conditions, but the rigidity is much greater in perforation, and gas can always be visualized beneath the diaphragm on the fluoroscopic table when the patient is brought into the erect posture.

The differential diagnosis of acute gallbladder lesions and pancreatitis was brought out above in recitation of the case histories.

Dr. Wangensteen said that most of the cases of acute pancreatic necrosis seen by him had been diagnosed acute intestinal obstruction because of the intense vomiting. The only varieties of bowel obstruction that would come into consideration are those types presenting tenderness, viz: the strangulation obstructions. Dr. Wangensteen felt that the recognition of acute bowel obstruction was one of the simplest of abdominal diagnoses. The concomitant occurrence of intermittent crampy pain at the acme of which loud borborygmi are heard with the stethoscope establishes the presence of intestinal colic. In pancreatic necrosis the abdomen is ominously silent on auscultation.

In twisted ovarian cyst, the pelvic findings usually predominate; in the cases of acute pancreatic necrosis observed by Dr. Wangensteen, the rectal and pelvic findings have been uniformly negative.

Acute appendicitis may be confused with almost any acute disorder of the abdomen. The onset is usually not as abrupt as in pancreatitis. Patients with appendicitis presenting diffuse abdominal rigidity are usually manifestly ill and the pulse would be found to be 120 and not 90 or less, as in most instances of acute pancreatic necrosis. Greater rigidity is usually present over the appendix and there is definite tenderness on rectal or vaginal examination.

With reference to treatment, Dr. Wangensteen said, the first case of acute pancreatic necrosis was successfully operated upon in 1890 by the late Halsted of Baltimore. He merely noted the findings, established the diagnosis and closed the abdomen. About ten years later, Hahn of the Friedrichshain hospital in Berlin operated successfully upon a second case. He drained the peritoneal cavity and attributed the recovery of the patient to this measure. In 1901, Halsted operated unsuccessfully upon the case in which Opie found a small stone impacted at the ampulla of Vater, which case has been the starting point of considerable investigative work relating to acute pancreatic necrosis. Whipple and a number of other investigators have since shown that the fluid in the peritoneal cavity is innocuous in pancreatitis and need not be drained off. In 1909, V. Haberer advocated routine drainage of the gall bladder in case of acute pancreatitis on the supposition that a block was present in the ampulla in most cases, the cholecystostomy serving as a drainage vent. A number of statistical studies have adequately shown that in only about 4 per cent of instances is a stone present in the ampulla; in about 14 per cent common duct stones are present. The generally accepted orthodox procedure in dealing with acute pancreatitis surgically is to place a gauze tampon down to the pancreas to permit the escape of the active ferment, trypsin.

It is readily apparent that there is no specific help in any of these types of procedure done at operation. Patients with acute pancreatic necrosis die of tryptic digestion of the pancreas. Trypsinogen is activated within the pancreas instead of by the physiologic activator, succus entericus, within the bowel. Splitting the pancreatic capsule or placing a tampon down to the pancreas would not appear to influence appreciably the process in the pancreas for recovery. Most instances of acute pancreatitis are a chemical digestion and not inflammatory in nature. Our therapeutic measures would appear to be better directed toward stopping the activation of trypsinogen within the gland itself. True enough, very little is known about the method of approach to the problem, but investigations along this line promise to be more productive of results than operation that accomplishes nothing specific.

Only in those instances in which jaundice is present or when the diagnosis remains in doubt should operation be performed. It is to be recalled that Halsted failed to find the stone at the ampulla in his case, now famous through the report of Opie, despite the fact that he opened and probed a dilated common duct. He frankly stated that he believed that he shortened the patient's life by operating.

If there be any common denominator of acute pancreatic necrosis it is gall stones or chronic disease of the gallbladder, one of these conditions being present in about 70 per cent of instances of acute pancreatitis. Dr. Wangensteen believed therefore that it was wise in most instances to do a delayed operation and to excise the gallbladder. The manner in which gallbladder disease predisposes to acute pancreatic necrosis is not well understood. Experimental acute biliary infections do not give rise to acute pancreatitis. Certainly our universally practiced method of treating acute cholecystitis conservatively should eventuate in a number of cases of acute pancreatitis if acute biliary infections were a precursor of pancreatic necrosis. The safety of treating acute biliary infections conservatively is well established. It was Dr. Wangensteen's impression that the cause of most instances of acute pancreatic necrosis was to be sought in a combination of factors which, when operating singly, were unable to produce the disease.

That the diagnosis of acute pancreatic necrosis can be made with some assurance without operation, Dr. Wangensteen felt to be well demonstrated in this small series in that every case was recognized, with the exception of the first. Dr. Wangensteen stated that only once had the diagnosis of acute pancreatic necrosis been made when the operative findings were negative. This patient complained of severe left sided pain, a sign to which Katsch of V. Bergmann's clinic has called attention as being of diagnostic import in acute pancreatitis. This patient later developed a frank pneumonia and Dr. Wangensteen felt that the abdominal pain was due to a diaphragmatic pleurisy. Dr. Wangensteen stated that none of the cases in his series complained of localized left sided abdominal pain. Dr. Wangensteen stated that he had no experience with the urinary diastase test of Wohlgemuth nor with the blood anylase test of Elman of St. Louis. He felt that these were not specific in that abdominal findings have been recorded in other conditions.

Dr. Wangensteen wished to stress the point that the usual symptomatology of acute pancreatic necrosis is more like that described here than that found in texts. The textbook description obtains usually only antemortum or in instances of "pancreatic apoplexy."

The operative mortality in dealing with acute pancreatic necrosis is more than 50 per cent, as shown by a number of statistical studies. Dr. Wangensteen felt if a patient might survive operation which accomplishes nothing specific for sixteen days that without operation the patient's chances were very much improved. There will naturally be deaths with conservative treatment, but Dr. Wangensteen felt that they would be less numerous. Practically all patients with "pancreatic apoplexy" in which large blood vessels are eroded die very quickly and dramatically with the typical picture of profound shock.

Starvation, Dr. Wangensteen felt, was to be an important item in the treatment because it inhibited in some degree the secretion of more tryptic ferment. Massive hot packs should be applied to the entire abdomen, and whatever narcotics are necessary to allay pain should be given. The vomiting of which these patients complain and the gaseous distention of the bowels are allayed by continuous nasal catheter suction siphonage, a measure that D. Wangensteen has found of great value in combating postoperative distention. The chief source of gas in the bowel is swallowed air, Dr. Wangensteen stated, and if the oral source is cut off, the distention will abate. Dr. Wangensteen said that he had treated four cases of simple mechanical bowel obstruction successfully without operation by this method. Enough fluid should be given by para-oral routes to insure a good urine output.

DISCUSSIONS (on pancreatitis)

Dr. J. F. Corbett stated that a condition which cannot be recognized clinically at all in many cases, and a condition that varies so much in its essential pathology, is going to add difficulties to the problem that confronts surgeons; but what he wanted to know was whether to operate or not to operate in these cases. He wished to compliment both the essayists and thought that a full discussion of the subject might aid materially in clearing up this subject.

In regard to Dr. Regnier's question in his case, Dr. Corbett felt that the answer would be determined by the kind of insurance; if this comes under compensation, he felt that the man would be entitled to collect; but if it comes under the ordinary accident policy, he felt the man could not collect because most accident policies say that the cause of death must be solely and alone due to the accident. He was of the opinion that in this case the policy is of fundamental importance.

Dr. T. H. Sweetser, as evidence in considering the advisability of delayed operations, called attention to three cases which had been under his father's care and with which he too was familiar. One patient, a victim of repeated gall stone colic, was brought to the hospital critically ill with signs of cholecystitis and acute pancreatitis. Operation was delayed for 14 days, after which the gallbladder was removed and the patient recovered. At operation the diagnosis was confirmed. The other two patients presented a complication which has not been emphasized this evening. The first of these came to them two months after the onset of acute pancreatitis. A pseudo-cyst of the pancreas was present when the patient arrived and at operation was found to contain 2,000 c.c. of fluid. In spite of drainage the pancreatic necrosis evidently spread gradually so that he died about two months later. At autopsy no remnant of living pancreatic tissue could be found. The second patient came complaining of abdominal distress and vomiting about four and a half months after a cholecystectomy for gall stones; it is reported that at that operation the surgeon had noticed patches of fat necrosis and enlargement of the pancreas. When she came to them a tumor could be demonstrated, which was proved to be a pseudo-cyst of the pancreas. The patient fully recovered following drainage of the pseudo-cyst.

Dr. Willard White was of the opinion that there are a number of things about this subject that are not understood, and he also believed that it was apparent that there are different factors that enter into the etiology in different cases. In Dr. Schwyzer's report there were 11 of his series that complicated disease of the tubes. It is difficult to explain the occurrence of pancreatitis with salpingitis; but most likely it would be either through the circulation or the lymphatic system.

Dr. White said that his own idea of why it is justifiable to operate on some of these cases of acute pancreatitis is based on his assumption that acute pancreatitis is due to the direct extension of disease in the bile passages and not necessarily by regurgitation of bile into the pancreatic duct. There are some factors which cause inflammation of the duct. The common duct of course passes through the head of the pancreas, and inflammation may extend into the pancreas by different extension and result in inflammation of the pancreas.

He cited one case of his own. The patient was a woman somewhere between 40 and 50 years of age, who entered the General Hospital with a picture of an acute and severe illness, with tenderness and pain located in the upper abdomen, and with a great deal of vomiting. He watched her for a while and was afraid not to operate. At operation he found a swelling of the pancreas. He drained the common duct, inserted forceps in the swollen area and she recovered.

He said he was greatly interested in hearing the other side of the question, that one should not operate on these cases.

Dr. E. A. Regnier said he was interested in Dr. Wangensteen's remarks and observation of this disease. He was of the opinion that the cases reported by Dr. Wangensteen were not all of fulminating type. He believed that a great many cases are of sub-acute type and that many of them would recover without operations. Cases of pancreatitis have been reported in children three or four years of age without any disease of the biliary tract but because of the high incidence of biliary disease associated with pancreatitis he had been led to assume that the two must be related. In the case Dr. Regnier reported he said he had diagnosed perforated ulcer first, and pancreatitis second, because of the absolute board-like rigidity of the abdomen, the absence of jaundice and the normal blood pressure. This patient appeared to be in shock, but his blood pressure was 124/72. Dr. Regnier did not believe that any surgeon would have dared refrain from doing a laparotomy on this patient. He felt that a fairly large per cent of these patients present symptoms that call for immediate operations. So far as treatment is concerned, Dr. Regnier did not see any good in incising the pancreas, but felt that the biliary tract should be drained when it was evident there was obstruction.

Dr. E. C. Robitshek said, in view of his limited experience in cases of acute pancreatitis, he hesitated to enter into the discussion. He had seen only two cases (both acute hemorrhagic in type) which he felt should be treated surgically. He followed the views of Sir Berkeley Moynihan, who divided the disease according to the classification suggested by Fitz, namely, of three types, the hemorrhagic, gangrenous and suppurative.

As to the symptoms, Dr. Robitshek desired to repeat, and emphasize, what had already been mentioned. First, pain. Pain, and not vomiting, shock, or cyanosis, is the first and most important symptom. According to Moynihan, "of all the pains the human body can suffer, this is by far the worst." Morphine gives little or no relief. Dr. Robitshek remembered distinctly the last case of acute pancreatitis he operated—a woman, who, in spite of a half grain of morphin sulphate, administered hypodermically at her home, shrieked with pain from the onset of the attack until placed under the anesthetic on the operating table. Among other important phases of pain, in these cases, are such as the pain being very sudden, and violent in onset, not infrequently following a hearty, heavy meal, most severe in the epigastrium, and radiating to the back or loins.

Second, vomiting. This is almost constantly present, occurs early, is severe, recurs frequently, and resembles the vomiting of high bowel obstruction.

Third, shock. This must be understood to mean a rapid, weak pulse, cold face and extremities, shallow respiration, pallor and low blood pressure, and not merely prostration and anguish of pain. Here again Moynihan says, "Of the existence of shock in acute pancreatitis there is never the slightest doubt. No such state is seen in any other abdominal calamity."

Fourth, cyanosis or livid spots. Halsted was the first to call attention to this sign, as seen on the face, or in irregular patches on the abdomen (frequently about the umbilicus), on the limbs or about the loins. Such patches when present in an acuate abdominal condition might be considered almost pathognomonic of pancreatitis.

Fifth, rigidity and tenderness. These are both present over the abdomen, but more especially over the epigastric region, yet not so marked as the board-like rigidity or marked abdominal tenderness seen in cases of perforated peptic ulcers.

Just a word about differential diagnosis; most of these cases Dr. Robitshek thought resembled, clinically, perforated peptic ulcers. It is well to remember, however, that acute pancreatitis occurs more frequently in females, whereas acute perforated peptic ulcers occur almost 100 to 1 times more frequently in males.

Dr. Robitshek said he had little or no faith in the Löwe test or in the Cammidge reaction, in cases of acute pancreatitis.

Dr. J. M. Hayes said he had enjoyed this discussion very much and felt that he had learned something from it. He said his experience with this condition was much the same as that of Dr. Robitshek. He had not seen the type mentioned by Dr. Wangensteen. Perhaps it was because they had not been diagnosed as early as those Dr. Wangensteen reports. He had explored just two cases and they both were extreme cases. The only reason for exploring them was that the diagnosis might not have been correct. Both of these cases reminded him of the description of Sir Berkeley Moynihan's cases. He says, when one sees the *facies* of one of these patients once he never forgets it. The patient is in extreme agony. The pain is almost impossible to relieve.

The first patient had been seen by another doctor and a diagnosis of cholecystitis made. He gave the patient a hypodermic of morphin, and was not called back to see him for twenty-four or thirty-six hours. When the doctor returned the patient was in extreme pain. Three-quarters of a grain of morphin had little effect on the pain. The patient was taken to the hospital at once. "Board-like" rigidity was present over the abdomen. The patient gave the picture of shock. He was explored immediately, a brownish fluid escaped and extensive fat necrosis was present. The abdomen was closed at once and the patient died a few hours later.

The second case was a patient brought in from the country. While climbing up on a load of hay he was suddenly seized with abdominal pain. He got down and went to the house and as soon as he reached the house he collapsed. When he reached the hospital, after a long ride through the country, his abdomen was "board-like" and he was in extreme shock. Again the only hope from an exploration was the possibility of an incorrect diagnosis.

He said he was very glad to listen to this report of these cases by Dr. Wangensteen. He had not observed this type of case, although he had seen such cases reported. He agreed with Dr. Wangensteen that very little could be expected from operation if one was absolutely sure of the diagnosis.

Dr. Corbett stated that he had had a few cases of pancreatitis. One of them he thought was gallbladder and he continued to think it was gallbladder as it went through much the same course that any gallbladder case does. Finally, an X-ray of the stomach showed a bit-out piece, and he then knew there was a cyst. He opened that case and apparently the whole pancreas came out. He brought the pseudo-cyst out and marsupialized it and that man recovered. The next case was a man who had rather indefinite symptoms and X-ray showed much the same picture, but unfortunately before the patient had got onto the operating table the cyst burst and was fatal. The next case was one of the most fulminating Dr. Corbett had ever seen. The woman seemed to have two distinct cycles of symptoms. The first was this semi-rigidity of the abdomen, perhaps a little more on one side than on the other, probably a 2+ rigidity. Then Dr. Corbett was in doubt as to the diagnosis. Pictures were taken for gas. These particular pictures were not clear and some more had to be taken. Very quickly the fulminating symptoms came on after that. Then the whole abdomen became rigid and board-like and had the appearance of a perforated ulcer. He operated and found a suppurated pancreatitis with peritonitis, and he lost that case also. The pancreas in that case seemed almost in the process of suppuration; it was a mass of suppurating tissue.

Dr. Corbett said it seemed to him that statistics were pretty doubtful unless one discriminates between cases, *i.e.*, between the fulminating and the slow cases. When one sees a mild case he thinks he might wait, but when he sees a case go back on him, he may think that if he had hurried a little the patient might have been saved.

Dr. H. O. McPheeters said he would like to ask one question, and that was in regard to coronary thrombosis in the differential diagnosis of these cases. In the milder cases and not the fulminating type, may not the pain be confused with that of coronary thrombosis when the latter is not typical?

Dr. Robert Schwyzer thought that coronary sclerosis has to be considered in these cases. There is also another condition of the abdomen that must be considered in the differential diagnosis and that is thrombosis or embolism of the mesenteric vessels. In this, the pain may be about the same as in pancreatitis.

Dr. Wangensteen stated that he was not a proponent of the idea of operating on acute gallbladders. It is true, he said, that surgeons who have made a practice of operating for acute cholecystitis have occasionally seen scattered areas of fat necrosis at operation. Zoeppfel of the Barmbeck Krankenhaus reported seeing ten such instances among 150 cases of acute cholecystitis operated upon in the acute stage. Zoeppel has described this condition as a "Vorstufe" or prestadium of acute pancreatic necrosis. Whereas there were no deaths in the ten cases seen by Zoeppel or in another small group by Arnsberger, the mortality of acute pancreatic necrosis is more than fifty per cent. Dr. Wangensteen felt definitely that these were not the same disease. If this pancreatic edema with scattered fat necrosis observed occasionally at operation in acute cholecystitis were a forerunner of actual pancreatic necrosis, Dr. Wangensteen believed that many deaths from acute pancreatitis should be observed as a natural complication of our conservative treatment of acute cholecystitis. On the contrary, acute pancreatic necrosis is rarely observed as a complication of acute biliary disease, but chronic disease of the biliary tract in some manner predisposes to acute pancreatitis. Dr. Wangensteen related here that when he and his associates had established a common channel of common bile and pancreatic ducts by placing a ligature at the ampulla in cats, pancreatic necrosis did not result. When, however, this was done and a gastrostomy was made and a fatty meal of milk and cream and bile salts fed, pancreatitis resulted in a large number of instances. Excision of the gallbladder diminished the likelihood to the development of pancreatitis after a fatty meal. The feeding of alcohol, carbohydrates, or protein food through the gastrostomy tube in the presence of the common channel did not produce acute pancreatitis.

Even though the case records recited had impressed Dr. Regnier as being rather mild forms of the disease, Dr. Wangensteen submitted that, inasmuch as all the cases that he had operated upon acutely had died, he felt that this distinction was not well founded. Dr. Wangensteen believed that the picture he described was of more frequent occurrence than the textbook description of shock and cyanosis. Actual shock rarely attends acute abdominal disasters, Dr. Wangensteen stated, unless there had been considerable bleeding. Rupture of solid viscera such as the spleen or liver with ensuant hemorrhage is frequently followed by shock. Dr. Wangensteen stated that he had never seen shock soon after perforation of a hollow viscus, such as a perforated duodenal ulcer. True enough, the patient may be severely prostated, but actual shock, as manifested by a rapid thready pulse or a depressed arterial blood pressure, is not present. Similarly, in acute pancreatic necrosis, Dr. Wangensteen felt that there would be true shock early only when "pancreatic apoplexy" is present. The prostration, however, may be marked. A number of ill-defined conditions are grouped together under the caption of shock, but clinicians should limit its use to a description of conditions in which the pulse is hurried and a marked depression of the arterial blood pressure is present.

Dr. Wangensteen stated in answer to the inquiry that, should he encounter acute pancreatic necrosis at operation, he would close the abdomen, unless the common duct were dilated, in which event he would drain the gallbladder. He believed that a perforated ulcer could be differentiated from pancreatic necrosis in all instances by the aid of the fluoroscope. In only one instance in this group of cases, Dr. Wangensteen stated, was the rigidity great enough to suggest a perforated duodenal ulcer. No air was visualized beneath the diaphragm. Some years ago, Dr. Wangensteen stated that he had closed by suture the perforation of a duodenal ulcer for a student. A year ago, the patient presented himself again with signs of a perforation, but no gas was visualized beneath the diaphragm on fluoroscopy and on plates taken in the erect posture; and it was therefore felt that a tag of omentum had sealed the perforation and no further leakage was occurring. The patient did well on conservative observation.

The delayed operation should be done for acute pancreatitis, Dr. Wangensteen believed, for the majority had gallbladder disease. In young patients (under 20) perhaps the same indication for the performance of operation did not exist, as it would be less likely that coexistent biliary disease would be found. Recurrent acute pancreatic necrosis may also occur, and even after excision of the gallbladder, but less frequently than if the biliary tract disease remains uncorrected.

Wohlgemuth believed the best diet in acute pancreatitis to be an anti-diabetic regime with high fat and protein content. Dr. Wangensteen felt on the contrary that fat was to be avoided because of the relationship of pancreatitis to fatty meals as shown in the experiments referred to above. Camus and Gley maintained that they had produced active trypsin in the pancreas by electrical vagus stimulation. As a corollary of this, Dr. Wangensteen felt that it might be advantageous to give atropin in the attempt to inhibit pancreatic secretion.

Dr. Corbett said he had enjoyed this program very much and he wanted to thank the men for the pleasure it had given him and he was sure the other members were of the same opinion.

Dr. T. H. Sweetser reported the following "Unusual Case of Adenomatous Prostate."

This case is reported to call your attention to the pathological and surgical importance of a small group of "accessory" gland tubules at the bladder outlet, the subcervical glands of Albarran. This group is barely mentioned in texts on urology and in some anatomies, but has been discussed occasionally in the periodicals and recently in a monograph on the surgical pathology of prostatic obstruction.

The patient, a man 77 years old, was brought to the hospital in critical condition during the subsidence of a protracted severe urinary hemorrhage. His urine was extremely foul due to the fact that he had catheterized himself for the past eight years without any attempt at aseptic technic. An inlying urethral catheter was not well tolerated. Therefore a prevesical incision was made down to the bladder wall, the wound was packed open, and on the third day the bladder was opened. Both stages were done under local infiltration anesthesia with as little insult as possible, but his blood pressure dropped and continued low. He died ten days after admission from circulatory failure and terminal bronchopneumonia.

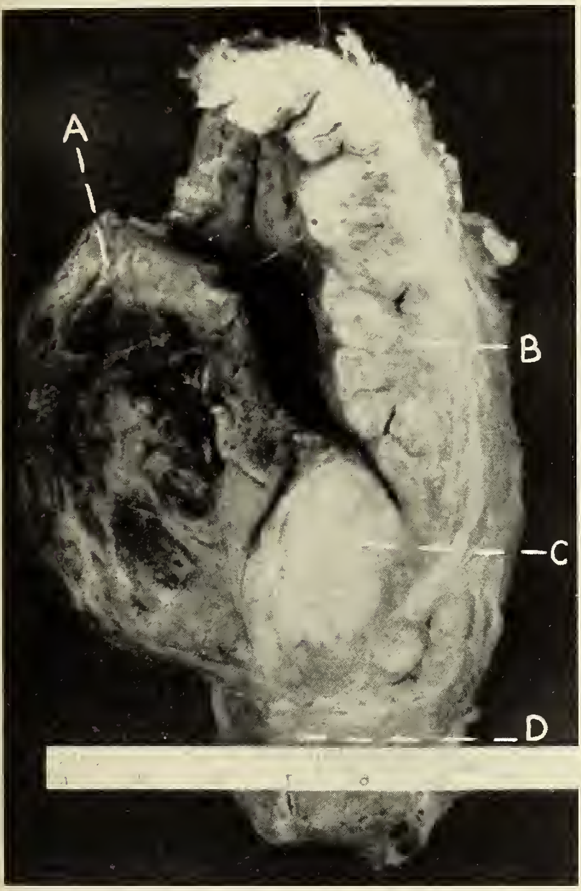
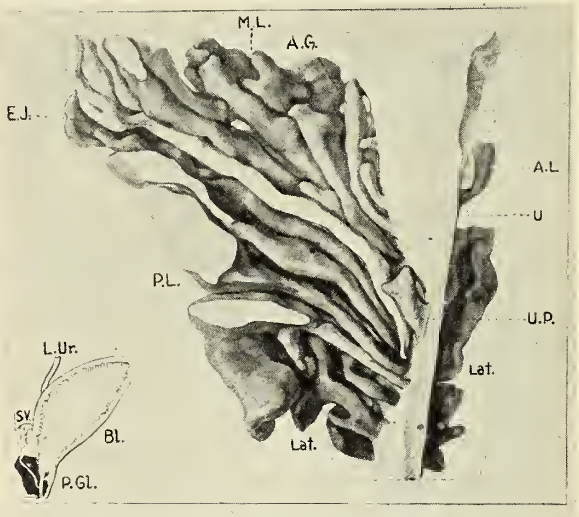


Fig. 1. Sagittal section through bladder, prostate, and pedunculated tumor. *A*, pedunculated tumor from Albarran's glands; *B*, bladder wall, mucosa greatly thickened; *C*, middle lobe of prostate; *D*, lateral lobe of prostate.

Autopsy showed a remarkable condition. True, there was found a moderate enlargement of both lateral lobes of the prostate and also of the middle lobe or commissural portion. But in addition there was a large soft hemorrhagic solid round mass almost filling the bladder and attached by a pedicle to the floor of the prostatic urethra proximal to the verumontanum. This mass was evidently an adenomatous enlargement originating in Albarran's group of subcervical gland tubules. The bladder wall was very thick, due quite largely to hyperemia and inflammatory edema of the mucosa. The pedunculated mass was the evident source of the hemorrhage and toxemia, as well as the principal cause of the urinary obstruction, forming a fairly perfect ball valve.

The illustration, a sagittal section, shows well the characteristics of enlargements originating in the middle lobe or commissural tubules of the prostate, and the characteristics of enlargements originating in Albarran's group of subcervical gland tubules.

According to Lowsley's description,[1] the prostate itself develops from five groups of tubules, anterior, posterior, middle, and two lateral, which in early embryonic life are separate, but which later coalesce to form a single organ. Separately, in the submucosa of the prostatic urethra, just at and distal to the bladder outlet, a group of tubules appear about the sixteenth week of fetal life, the so-called Albarran's subcervical glands. They are separate from the prostate, of somewhat different structure microscopically, and may enlarge independently without prostatic hypertrophy.



Sagittal view of a wax model of the prostate of a new-born infant. × 14. *Lat.*, anterior tubes of lateral lobes; *P.L.*, posterior lobe; *E.J.*, ejaculatory duct; *S.V.*, seminal vesicle; *A.L.*, anterior lobe tubule; *U.*, urethra; *U.P.*, utriculus prostaticus; *A.G.*, subcervical glands of Albarran; *M.L.*, middle lobe tubules; *L.Ur.*, left ureter; *Bl.*, bladder; *P.Gl.*, prostate gland.

Fig. 2. Reduction from illustration in article by Lowsley,[1] Journal of Anatomy, 1912.

Alexander Randall has well described the differences in the effect of enlargement of these various structures.[2, 3] The middle lobe of the prostate, being situated underneath the trigone muscles, pushes upward under them and projects into the bladder as a sessile rounded mass in the midline. Albarran's glands, being situated in the submucosa overlying the muscle bundles that extend from the trigone into the prostatic urethra, enlarge directly out into the urethra and thence upward into the bladder. Being restrained by no overlying muscle, such an enlargement is globular and soon becomes pedunculated and lies within the bladder attached by a pedicle to the floor of the urethra.

Diagnosis may be made by cystoscopy, but a marked enlargement originating in Albarran's glands may be confusing if one does not keep that entity in mind.

Surgically, it is readily seen that, while the enlarged prostatic middle lobe may be removed in one mass with the enlarged lateral lobes either suprapubically or through the perineum, the removal of a greatly enlarged pedunculated subcervical gland mass is quite a different matter. Such a mass may easily be removed through a suprapubic opening by division of its pedicle; enucleation of any prostatic enlargement that may be found would then be an independent step in the operation. During a perineal prostatectomy, on the other hand, an enlargement of Albarran's glands may easily be missed entirely, especially if large and pedunculated as in this case; the operation will then fail to give relief. With the enlargement of such a size as seen here it would seem to me that, even though recognized preoperatively, satisfactory removal perineally would be impossible; only a suprapubic approach would be adequate.

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DISCUSSION

DR. O. H. WANGENSTEEN asked Dr. Sweetser if it is not true that Zuckerkandl and Tardler, in their monograph on hypertrophy of the prostate, state that prostatic hypertrophy of the prostate itself is due to the growth of the paraurethral glands into it.

The meeting adjourned.

H. O. MCPHEETERS, M.D.,
Secretary.

INJECTABLE OVARIAN PREPARATIONS OMITTED FROM N. N. R.

In 1930, the Council on Pharmacy and Chemistry omitted all desiccated ovarian preparations for oral administration, provisionally retaining those intended for intramuscular or hypodermic administration. The manufacturers of these products were informed that these would be omitted at the close of 1931, unless meanwhile acceptable methods of assay for hormone content were adopted and acceptable evidence for their effectiveness, submitted. The interested firms have not submitted such evidence. As to the adoption of an assay method, it was later decided, on the basis of opinions expressed by the Council's consultants that our present knowledge make it undesirable to adopt assay methods for the determinaton of the hormone content of these water-soluble preparations. Since no acceptable evidence exists for the usefulness of such preparations, the Council voted to omit Ovarian Substance Soluble Extract—P. D. & Co.; Corpora Lutea Soluble Extract—P. D. & Co.; Corpus Luteum Extract-Lederle, Corpora Lutea Soluble Extract—Wilson, and Sterile Solution of Lutein—H. W. & D. (Jour. A. M. A., January 30, 1932, p. 402.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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EYE, EAR, NOSE AND THROAT

EXTRACTS FROM THE PROCEEDINGS OF THE SIXTH CONGRESS OF OTO-LARYNGOLOGY OF THE COUNTRIES OF THE NORTH. (Acta Oto-Laryngologica, Vol. XVI.)

Frithiof Leegaard (Oslo), *The Treatment of Inflammation in the Nasal Sinuses.*

The author and a large number of those who discuss his paper, voice their experiences particularly in regard to: (1) radical sinus surgery with complete removal of the membrane or partial removal, (2) the problem of adequate treatment in chronic frontal sinus infections.

Leegaard reports excellent results in chronic maxillary infection with a compromise between the radical method of the Caldwell-Luc operation and the making of an ordinary sinus window. He makes an unusually large opening in the inferior meatus, and then removes the tip of the overlying inferior turbinate. He believes that the removal of the anterior tip is an important factor in his successes. This procedure suffices for the majority of causes and only rarely does the author resort to the Caldwell-Luc operation.

The consensus of opinion seems to be that as good if not better results are obtained by removal of only diseased antrum lining as are obtained by a complete curetting or stripping out of the membrane.

Frontal sinus surgery after the method of Barany has several enthusiastic supporters. The author offers twenty-nine case reports. The method includes removal of the floor through an orbital approach. A large opening is made into the nose, the frontal process of the maxilla is removed completely to the pyriform aperture and also a portion of the nasal bone. A flap of nasal mucous membrane is then taken from the lateral nasal wall or the septum and swung up to line the passageway from the sinus to the nose. Paraffin gauze is used to tampon the passageway for the next 5 or 6 days. The sinus is then flushed once daily with sterile salt solution until healed. Only the diseased portion of the sinus membrane is, as a rule, removed.

F. Soderberg (Upsala) *About the Results of Barany's External Operation of the Frontal Sinuses.*

The Barany method of frontal sinus operation has been used in the Otological Clinic in Upsala for seven years. For this report the cases were re-examined to determine the end results. Forty-one cases constitute the group. Thirty-seven showed an adequate open communication between the sinus and nasal fossæ. In thirty-one of these cases the sinus membrane was left. Two of the cases died following operation.

S. Mygind (Copenhagen) *Treatment of Otogenic Sepsis and Sinus Thrombosis.* (Report from the Copenhagen Commune Hospital.)

In a period of eight years (1915-1922), 1000 mastoidectomies were performed. In this series there were ninety-eight cases of sinus thrombosis. The treatment of this complication consisted of jugular ligation and removal of thrombi. The mortality of cases so treated was 45 per cent.

In the eight years (1923-1930) following the completion of this first series, about 2,000 mastoidectomies were performed. The incidence of sinus thrombosis in this group amounted to 101. In treating this complication in this series, a conservative plan was followed. In only eight of the cases was jugular ligation thrombectomy done (six of the eight cases succumbed). The mortality was only 29 per cent.

Discussing these results, the author emphasizes the fact that series of statistics are difficult to compare properly. In institutions, cases are often admitted late; the type of infection prevalent, the incidence of brain abscess, and the proportion of acute to chronic infections all play a part in influencing the mortality rate. He believes, however, that in spite of the probability that they were better able to treat their cases in the second series because of added experience, and also the indication that the second series may have included less severe infections, conservative treatment results in a higher percentage of cures. The incidence of complication in the first series was ninety-eight cases of sinus thrombosis and twenty-seven of brain abscess to 1,000 mastoidectomies, while in the second series there were 101 cases of sinus thrombosis and 26 cases of brain abscess to 2,000 mastoidectomies.

Mygind concludes that any operation on the sinus or the jugular vein carries with it, because of the trauma, a certain added factor of risk. This is the result of: (1) the necessity of a new clot forming which probably becomes infected, (2) an interruption of the circulation which must be of consequence to the brain, meninges, and the power of resistance of the venous walls, and (3) the direct trauma of operation on the sinus, accompanied by the plugging.

Lawrence R. Boies, M.D.

GYNECOLOGY AND OBSTETRICS

THE DIAGNOSIS OF PREGNANCY BY THE BROUHA-HINGLAIS-SIMONNET REACTION: L. Brouha and H. Hinglais. (Gynecologie et Obstetrique, Tome XXIV, No. 1). This test is based upon the fact that the urine of pregnant women contains a specific hormone, and when samples of this urine are injected into immature male mice, puberty is brought about within a few days. This is determined by a rapid increase in the weight of the animal and especially by an increase in the size of the seminal vesicles.

Puberty in these animals normally occurs during the fifth or sixth week and is characterized by a definite increase in weight. For the test one should use mice of a known age, or weighing less than 10 grams. Samples of urine from 142 normal non-pregnant women were inject into 310 mice. In no instance was there any evidence of the specific hormonal reaction as shown by the characteristic changes. Samples of urine from thirty-seven non-pregnant women who were being treated in the clinic were injected, with no reaction which would suggest the presence of a specific hormone. Samples of urine from seventy-two pregnant women were injected into 291 mice. All of these showed characteristic reactions, namely an increase in the size of the seminal vesicle amounting to ten times that of the controls.

The urine is treated with ether and filtered as in the Zondek test. Increasing the dose does not hasten the reaction. Three injections of 0.3 c.c. a day for four days. Changes begin to appear in forty-eight hours and are characteristic by eight to ten days.

Up to date, tests from the urine of 400 pregnant women gave uniformly positive results, except in one instance through technical error. In the absence of pregnancy the test was always negative. Positive tests have been obtained as early as 8 days after the first missed menstrual period. The test remains positive for a few days following labor. In cases of death of the fetus, whether uterine or ectopic, the hormone continues to be present in the urine till the placenta is expelled or destroyed. In cases of hydatid mole, the test is positive and remains so as long as the mole is active.

The authors conclude that, in the hands of experienced workers who are familiar with the reactions in male mice, the test is sufficiently definite to be of great practical value.

A. L. McDONALD.

THE INFLUENCE OF A SALT-FREE DIET UPON LABOR: Hofstein and Petrequin (Strasbourg) (Gynecologie et Obstetrique, Tome XXIV, No. 2). The authors noted that certain women, who had been placed upon a salt-free diet for therapeutic reasons, were able to deliver themselves rapidly and comparatively painlessly. In the case of two primiparas the total period of labor was three and one-half and four and one-half hours, and for two multiparas the time was two and one-half and three and one-half hours.

A study of the literature failed to furnish any explanation. Studies of the chloride content of the blood in some twenty women during labor, in order to determine any possible relationship between the chloride content and duration of labor, gave inconclusive results.

A group of seven women were placed upon a rigid salt-free diet for from two to six weeks preceding labor. In the case of five primiparas, the period of dilatation was from two and one-half to five hours; with two multiparas, the period was one and six hours. The authors offer no explanation but consider the findings suggestive.

A. L. McDONALD.

THE USE OF AN ANTERIOR PITUITARY LUTEINIZING SUBSTANCE IN THE TREATMENT OF FUNCTIONAL UTERINE BLEEDING. Emil Novak and G. B. Hurd (Am. Jour. Ob. and Gyn., Vol. XXII, No. 4). Functional uterine hemorrhage in young women frequently recurs following curettage. Radiation therapy is too uncertain in these individuals. Repeated curettage may tide over till an equilibrium is reached. The pathological findings in ovary and endometrium are somewhat characteristic.

The ovary shows persistence of an unruptured graafian follicle and absence of corpus luteum. The ovarian disturbance consists of a persistence and excess of follicle stimulus, with an absence of the progestin influence, corpus luteum. This is confirmed by findings in the endometrium where there is no evidence of changes usually produced by the progestin furnished by corpus luteum. The prolonged influence of the follicle hormone without the inhibitory effect of progestin causes menorrhagia. The condition in the endometrium is not a true hyperplasia, but represents a persistence and exaggeration of the interval stage. The authors consider that these disturbances are due to abnormalities in the pituitary anterior lobe secretion.

Investigators agree that the anterior lobe produces two hormones: "Prolan. A" concerned with follicle growth and ripening; "Prolan. B" concerned with luteinization in the ovarian follicle. The pituitary secretion is increased during pregnancy and large amounts are found in the urine. Zondek has isolated both hormones in watery extract from the urine. The dominating influence of the secretion as isolated from the urine during pregnancy is to stimulate luteinization, increase the size of the uterus and ovary. The characteristic finding in these cases of bleeding is absence or deficiency of luteinization. Theoretically, the administration of corpus luteum extract should re-establish a balance. This has not been possible in practice.

A substance containing Prolan. B should convert the granulosa cells of the ovary to lutein cells and supply sufficient progestin to maintain a proper balance. The authors have been working with a substance obtained from the urine of pregnant women, a concentrate precipitate, with inert matter removed. While varying in strength they found that in experimental animals the extract produced luteinization. Theoretically, if this could be accomplished in the patient, the ovaries would produce their own progestin, and effect an equilibrium. The material used has been freed of the follicle hormone, Prolan. A, is non-irritating and non-toxic.

The dosage was arbitrarily established at 200 rat-units by intramuscular injection, daily. They hope to secure luteinization of the granulosa cells of the ovary, and thereby transform the "Stationary Hyperplastic" condition of the endometrium to the pre-gravid form, thus re-establishing a balance. The results were often too rapid for this explanation and seemed to be due to direct effect upon the unknown bleeding factor.

In all but seven of fifty-one cases the results were prompt and striking.

A. L. McDONALD, M.D.

MEDICINE

TUBERCULOSIS ABSTRACTS*

Sanocrysin (sodium-gold-thiosulphate) was announced by Mollgaard in 1924. Clinical observations of the effect of the drug, published by numerous European writers since then, have been decidedly variable. Generally speaking, favorable results have been reported of cases with the exudative type of lesion, while little clinical improvement has been noticed in cases of the chronic type. Since some of the clinical reports do not seem to justify the conclusions drawn, a group of investigators in the William H. Maybury Sanatorium in Michigan decided to make an intensive study of the effect of sanocrysin on a small, carefully selected, closely comparable group according

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*From *Tuberculosis Abstracts*, a review for physicians issued monthly by the National Tuberculosis Association, Vol. V, Number 1, January, 1932.

to a prearranged plan. Results of the study were published in the October, 1931, American Review of Tuberculosis, of which the following is a brief abstract.

A TRIAL OF SANOCRYSIN

Mollgaard claimed that sanocrysin has a specifically curative effect on tuberculosis. He believed that the drug, introduced into the blood stream, permeates tuberculous lesions and there kills many, if not all, of the tubercle bacilli. Exudative, not too acute, pulmonary lesions of early age, being more pervious than the fibrous type, were considered more responsive to treatment. The fever, albuminuria, eruptions, and loss of weight resulting from the treatment were attributed to the liberation of toxins from the disintegrated bacilli. To offset the ill effects, an anti-serum was developed, and this was administered at the first sign of reaction; namely, albuminuria.

Other workers used the drug, as well as various other gold compounds, in human cases. The amount of gold in these compounds varies greatly; sanocrysin contains 37.4 per cent of gold. The present consensus of opinion seems to be that the chemical is not a specific bactericide, that nevertheless favorable responses sometimes occur, and that the toxic properties of the drug compel consideration. Metallic poisoning, rather than tuberculin-like shock, seems to account for the unfavorable reactions; consequently, Mollgaard's anti-serum has been discarded by most clinicians and smaller doses of sanocrysin are given.

PLAN OF TRIAL

The treatment was explained to a group of patients of the William H. Maybury Sanatorium. The 24 patients who were finally chosen from among the volunteers were all in good general condition, who would, therefore, not be likely to suffer ill effects from the drug. Most of them had benefited to some extent by the routine sanatorium treatment, but the healing of their disease was slow and incomplete. The lesions were chiefly of the exudative and mixed exudative-productive types. All were free from complications.

On the basis of clinical, X-ray and laboratory findings, the patients were then divided into two equal and comparable groups, cases being matched one with another as closely as possible. By a flip of the coin, Group I was designated as the sanocrysin-treated and Group II as controls. The patients themselves were not aware of any distinction in treatment.

METHOD OF OBSERVATIONS

The patients were put to bed for a month prior to starting any medication, during which time uniform data and information were collected to serve as a basis of comparison. The preliminary thirty days' study was carried out in the following manner:

1. The chest was examined biweekly, particularly to determine any variation in the extent or distribution of the râles, the findings being described in the record.
2. The chest was X-rayed (stereoscopic) at the beginning and at the end of the month and the films preserved, special notes of any changes being recorded.
3. Careful records of the presence and clinical course of complications and symptoms were made.
4. The sputum was weighed daily, and this figure was charted; also averaged at the end of the month.
5. The sputum was examined microscopically every two weeks to determine the presence of tubercle bacilli. A method of sputum concentration and animal inoculation was used routinely when indicated.
6. Body weight was measured and recorded weekly.

At the end of this preliminary checking, the same routine was continued during the period of the trial, except that physical examinations were done more frequently, particularly to show the presence and behavior of perifocal reactions, and stereograms of the chest were made monthly; oftener in cases showing rapid change.

Each patient receiving sanocrysin (Group I) was started with 0.1 mg. of the drug, dissolved in 2 c.c. of distilled water and injected into a cubital vein. At intervals of four days, unless contraindicated, additional injections were given, increasing by 0.1 gm. up to 0.3 gm., and then increasing to 0.5 gm. The amount of distilled water was increased to 5 c.c. when the dose of sanocrysin exceeded 0.3 gm. The 0.5-gm. dose was then repeated until the course was completed. The number of injections varied from nine to fourteen, and whenever there was a suspicion of a dangerous reaction the next dose was reduced, omitted or postponed. The total amount of sanocrysin administered to single patients varied from 3.1 to 6.1 gm., while the total amount per kgm. of body weight varied from 0.6 to 0.1 gm. The patients treated as controls (Group II) each received 14 intravenous injections of distilled water (2 c.c. each) at intervals of four days.

EFFECTS OF TREATMENT

The detailed effects on the tuberculous conditions are minutely described in the article. The observations include the effect on temperature, pulse, lassitude, body weight, cough, sputum, appetite, sleep, physical findings, pain in chest, hemoptysis, dyspnea. Similarly, the toxic effects referable to the drug are noted as these affected the skin, nerves (neuritis), mucous membrane, eye, gastrointestinal tract, liver, kidney, etc. Laboratory evidences were as carefully and as fully studied. The study lasted approximately six months, during the first two of which sanocrysin treatment was given. During the entire period of the trial, both groups were kept in bed.

A follow-up of patients was instituted one year after the close of the study. In finally determining the effects of the treatment, all the observations were correlated. Chief reliance was placed on such factors as changes in the X-ray shadows of pulmonary lesions, presence or absence of tubercle bacilli in the sputum, measurable symptoms such as temperature, and fluctuations in body weight. Changes in physical signs were not given much value. Toxic effects of the drug were distinguished as far as possible from symptoms referable to the disease itself. A summary of the results is as follows:

	Group I (Sanocrysin)	Group II (Control)
Number	12	12
Slightly improved	5	6
Much improved	1	1
Unchanged	0	3
Slightly worse	1	1
Much worse	4	
Slight toxic effect	8	
Severe toxic effect	3	
Fatal	1	

CONCLUSIONS

"1. This investigation proves the need and the merit of a carefully prearranged plan to be followed in a clinical test of a chemotherapeutic agent in tuberculous patients.

"2. We discovered no evidence in 12 cases, studied according to such a plan, that sanocrysin, given in small, gradually increasing doses up to a total of 6.1 gm., has a beneficial effect on pulmonary tuberculosis or its complications.

"3. Compared with 'control' cases, more of our sanocrysin-treated cases became worse. The evidence is strongly suggestive that sanocrysin was at least partly responsible for the unfavorable trend of the disease in some of these cases.

"4. Sanocrysin exerted definitely harmful systemic effects in all our treated cases, partly as a secondary result of its action on the local tuberculous lesions, but mostly, we believe, by virtue of its own inherent toxicity. These effects were usually on the nutrition, gastrointestinal function, temperature, skin, mucous membranes and kidneys.

"5. One sanocrysin-treated patient died from parenchymatous degeneration of the liver and other effects which we interpret as gold poisoning. We could not anticipate this unfortunate outcome.

"6. Because of the lack of definite evidence of benefit and because of positive evidence of harm which in some respects is long-lasting, especially in the kidneys, the use of sanocrysin, as we used it, is not justified."—*Sanocrysin in Pulm. Tuberc., J. Burns Amberson, Jr., B. T. McMahon, and Max Pinner, Am. Rev. of Tuberc., Oct., 1931.*

PEDIATRICS

TREATMENT OF ANEMIA OF INFANCY WITH IRON AND COPPER: H. Joseph (Bull. Johns Hop. Hosp., XLIX, 246, No. 4, October, 1931). In this paper Josephs reports a study of the treatment of so-called "secondary anemia" of infancy with iron and copper. The investigation was conducted on a group of infants ranging between three months and two years of age. The iron was administered in the form of a 10 per cent solution of ferric ammonium citrate, giving 2 c.c. per kilogram of body weight per day. The copper was administered in the form of a 0.5 per cent solution of copper sulphate, giving 1 c.c. per kilogram of body weight daily. From these studies Josephs found that copper accelerated the rise in hemoglobin when given in addition to iron. This acceleration was most evident when the hemoglobin was above 50 per cent, for above this point the hemoglobin curves from cases on iron alone tended somewhat to flatten out, whereas those from cases on iron and copper continued to rise steeply up to about 70 per cent. In this series it made no difference in the speed of recovery whether the child was on a diet of milk alone, or whether vegetables or eggs were included, and medicinal iron was found to be superior to food iron in causing a rapid recovery. The effect of the iron is first on the reticulocytes, then on the hemoglobin, and there usually exists a latent period before the effect on the hemoglobin is manifested by a rise. The end of the latent period appears to coincide with a sufficient rise in reticulocytes. Copper appears to accelerate hemoglobin formation, and has no effect on the reticulocytes.

C. A. STEWART.

DIE KLINISCHE BEDEUTUNG DER CRANIOTABES: I. Jundell (Acta Pædiatr., XII:1:1-40, September, 1931). In order to determine whether or not craniotabes was of clinical significance in the diagnosis of rickets, the author tested out the value of antirachitic treatment in a group of 129 infants. In all cases, the mothers were given either cod liver oil or vigantol before delivery, and the infants were similarly treated after birth. A control group of seventy-nine infants was kept on the same regimen of feeding and supervision, but given no anti-rachitic treatment. Monthly observations were made in most cases. In a few infants of each group a supra-occipital craniotabes was detected during the first month; the incidence gradually increased until the fifth month, when 65 per cent of the treated group and 58 per cent of the controls showed this type of craniotabes. After the fifth month, there was continuous evidence of healing until the 13th month, when no craniotabes was found in either group. A softening of the parietal bones occurred in 31 per cent of the treated cases and in 25 per cent of those untreated; this softening was noted in the largest number of cases in both groups during the third month and disappeared in both after the sixth month. There was no effect of antirachitic treatment apparent in either of these types of craniotabes.

During the 15 months period over which these infants were observed, clinical signs of rickets (*i.e.*, rosary or enlarged epiphyses) were definitely noted in two of the treated cases and 18 of the controls. On every visit after the fourth month, X-ray plates were made of the right hand, whenever possible. One infant out of 110 of the treated group showed evidence of mild rickets, which had entirely healed one month later; ten of the fifty-nine control infants were found to have signs of mild or severe rickets. The author therefore concludes that specific treatment which prevents rickets has no effect on craniotabes, and that the latter should not be looked upon as a clinical manifestation of the disease. He believes rather that craniotabes is a physiological or simple hypoplastic phenomenon and suggests that it might be produced by the pressure of the growing brain against the bones of the head while the child is in a horizontal position—a condition which would not obtain in primitive tribes where the infant is carried in a vertical position for the greater part of the day.

Louise G. Frary, M.D.

VACCINE TREATMENT OF ASTHMA IN CHILDHOOD: A. Graeme Mitchell, M.D., and Merlin L. Cooper, M.D., Cincinnati (Arch. Ped., December, 1931, Vol. XLVIII, No. 12). Practically it appears that the asthmatic patient is hypersensitive, or, to employ more acceptable terminology, allergic, to certain substances which in most instances are obviously protein in nature. Whether the allergic state is inherited or whether it is acquired, removal of contact or desensitization of the patient may be curative so far as the attacks are concerned. It is this fact which is taken advantage of in treatment.

A certain number of cases of asthma are associated with upper respiratory tract infection. That is to say, the paroxysmal attacks follow acute nasopharyngitis.

In the authors' work with asthma as it relates to upper respiratory tract infections, they carefully cultured the material obtained by swabs from the patient's nose and throat, preferably during an attack of acute upper respiratory tract infection, testing the skin sensitivity to the various microörganisms obtained; preparing and injecting mixed vaccine made from the individual vaccines of the microörganisms to which the patient was skin-sensitive by intracutaneous test. In treatment, one-half to one minim was injected subcutaneously, and, depending upon the degree of local reaction, which should not be too severe or last more than twenty-four hours, this dose was repeated or increased daily until a maximum of eight minims was reached, upon which this amount was given two or three times a week for several weeks longer.

Some authors have obtained equally good results in asthma with stock as well as with autogenous vaccines, and it has been reported that injections of tuberculin cause the arrest of asthmatic attacks.

A certain number of children, whose asthmatic attacks are associated with upper respiratory tract infections, are decidedly benefited by vaccines and in some instances attacks, which have previously been frequent and severe, cease for months or years after such treatment. Vaccines may be helpful when other methods have failed.

It is not clear whether the vaccine treatment acts by specific desensitization to microörganisms which the patient harbors in his nose and throat and which may be causative of the asthmatic attacks, or whether the mechanism is simply one of non-specific protein therapy.

Every child suffering from asthma, especially when the attacks are associated with upper respiratory tract infection, should be given the benefit of a trial with treatment by a properly prepared and administered vaccine when other measures of treatment fail.

R. N. Andrews, M.D.

IMPETIGO CONTAGIOSA NEONATORUM: Irwin Rubell, M.D., Chicago (Arch. Ped., Dec., 1931, Vol. XLVIII, No. 12). The lesions observed in our series grouped themselves into three types: The bullous, the pustular and a third group for which the term sebaceous would seem appropriate. All three types of lesions frequently occurred simultaneously in the same patient.

Labhardt and Wallart, in their cases of congenital impetigo, obtained the staphylococcus, and occasionally the streptococcus or diplococcus.

The course in most cases was benign and the outcome favorable. However, complications may occur and be very severe or even fatal. One patient, suffering from an extensive pemphigoid eruption with much exfoliation, developed bronchopneumonia to which he succumbed.

Prophylaxis: All babies received a daily sponge with 1:5000 bichloride of mercury which was rinsed off with clear water within two minutes. The scales were washed daily with a 1:1000 bichloride. In order to avoid excessive handling and possible contamination of babies' clothes, the following technic was carried out: Upon delivery from the laundry, the various articles of infants' wear were sorted into separate bundles, labelled and sent through the operating room sterilizers. The nurses would then use sterile forceps to remove the articles needed. No one was permitted into the nursery except the nurses actually on duty there. Attending physicians had to wear gowns and gloves when examining infants.

A baby once removed from the well nursery was never returned there. A mother suffering from an infection of any kind was transferred to another floor, and the baby removed to the children's ward. Visitors to the mothers were limited to two a day and were excluded from the room when the baby was brought in for nursing. Overcrowding of the nursery was an important factor in spreading the infection.

Treatment: In response to a questionnaire, the Society of the Lying-In-Hospital of New York states that exposures to the alpine sun-lamp gave the most satisfactory results. In the author's cases, the lesions were opened as soon as discovered, touched up with 95 per cent alcohol, followed by the application of two per cent ammoniated mercury ointment.

R. N. Andrews, M.D.

ROENTGENOLOGY

INDICATIONS FOR VARIOUS RADIOLOGICAL PROCEDURES IN THE EXAMINATION OF THE LUNGS: RADIOSCOPY, TELERADIOGRAPHY, STEREORADIOGRAPHY. Dioclès and Azoulay (Revue de la tuberculose, 1931, XII, 957).

According to these members of the staff of the Hotel Dieu in Paris, Radioscopy is a useful procedure and may even be substituted for radiography in certain cases, as in the examination of patients with advanced lesions in dispensaries, where on account of the expense and labor involved it would be impracticable to make a film in every case. It has the advantage of permitting changes in the position of the patient and of showing the movements of the heart, lungs and diaphragm. They recommend that skiascopy be always used before a film is taken in order that the best position for taking it may be determined. Radioscopy alone should not be relied upon if negative when the history of the case suggests the presence of lesions too fine to be detected by it.

Teleradiography must *always* be used in taking chest films according to these writers. Their technic is as follows: A fine focus tube is used (3 millimeter or less), *a distance of 1.5 to 2 metres,* an exposure of a tenth of a second or less, a high kilovoltage (120 to 150 kilovolts) and an amperage of 100 to 150 milliamperes. In certain cases as in pleuro-pulmonary sclerosis or very extensive infiltration, the "rotating antidiffuser" (Stephani), which seems to be a kind of very rapidly moving Bucky diaphragm, may be used in addition, but this is rarely necessary.

Stereoradiography permits better localization of lesions and determination of relations than the use of flat films. The writers recommend it when oblique films are taken as well as when antero-posterior or postero-anterior films are used. The posterior left oblique position gives good pictures of the posterior mediastinum, the bifurcation of the trachea and of the mediastinal gland area. The posterior border of the left heart is thus clearly defined. This is the position of choice in the study of adenopathy and of tumors of the mediastinum. The anterior right oblique position gives excellent views of the mediastinum, of the aorta, and of its crossing over the trachea and of its bifurcation. Lipiodol injections with stereo-radiography may help to determine the significance of puzzling shadows, for instance one at the right base, above the diaphragm, which may be due to bronchiectasis, to pleural thickening, to an abscess of the lung, to interlobar, mediastinal, or diaphragmatic pleurisy, to pyothorax, to abscess of the liver, cancer or suppurating hydatid cyst.

A. T. LAIRD, M.D.

SURGERY

PLANTAR TENDERNESS AS AN EARLY SYMPTOM OF THROMBO-PHLEBITIS. Dr. Gerhardt Tschmarke, Leipzig (Der Chirurg, Volume No. 3, Number 21, November 1, 1931, Page 924). Payr is the first to call attention to a tenderness, experienced by the patient on pressure of the sole of the foot, as an early sign of thrombo-phlebitis in the veins of the lower extremities. Observation at his Clinic since then has corroborated this sign as worthy of observation. For example, in sixteen cases of primary thrombophlebitis in the veins of the foot and calf, five times this plantar sensitiveness was the only symptom to call attention to the condition, whereas eleven times it was associated with other subjective and objective signs. Cases of thrombo-phlebitis, which otherwise would escape attention, can in this way be discovered, and proper measures taken to prevent complications, such as embolus.

The statistics show that over a period of years, in thrombo-phlebitis was recorded as occurring in 1 to 2 per cent of the cases, but with this sign as an index, further observation showed evidence of thrombo-phlebitis in as many as 16 per cent of the cases. These latter cases were not recorded as thrombo-phlebitis unless, aside from the objective plantar tenderness, there were also, later, other objective signs, such as edema and measurable swelling. It was the author's experience that either immediately or within the next twenty-four hours after the development of this tenderness, other signs would show, such as edema and swelling, infiltration of the calf of the leg, and muscular resistance against passive dorsal flexion of the foot.

In the absence of any objective signs of thrombophlebitis, one is apt to overlook or minimize the patient's complaint of paresthesia in the foot, or a sense of tension in the calf of the leg. If, however, the tenderness in the sole of the foot is present, one can look for further trouble in the development of thrombo-phlebitis within the next twenty-four hours. For that reason the author considers this finding the earliest sign of thrombo-phlebitis.

It has been the experience of the author that the earlier treatment is established the better one can avoid complications. Likewise, early treatment will cause a much quicker resolution of the thrombo-phlebitis than if the condition is allowed to advance. As soon as this sign is elicited, the author elevates the extremities in a comfortable position on pillows, uses dry hot air several times daily to cause an erythema of the skin—in the interval using hot compresses of 30 per cent alcohol or subacetate of aluminum solution.

Thus, the author concludes, the detection of tenderness on plantar pressure is an early sign of thrombophlebitis, which can be elicited by routine examination daily. The value of this sign is in the prevention of complications by early treatment.

A. E. SOHMER, M.D.

THEELIN AND AMNIOTIN

The new preparations of ovarian hormone, such as Theelin and Amniotin, have been used in a large number of cases of troublesome menopausal symptoms, but the results obtained are by no means uniform. In many cases, no relief at all is obtained, whereas in others the benefit derived is excellent. In some cases in which good results are observed, part of the success may be attributed to the psychologic effect of the injections. (Jour. A. M. A., December 12, 1931, p. 1822.)

OBITUARY

(Continued from page 192)

own specialty but also in the wider fields of medicine. He was not a great contributor to medical literature but was a keen observer, an excellent teacher. Ever tolerant of the opinions of others, his criticism was ever tempered with kindliness and praise for the younger man and his work. With continued interest in educational matters during later years, his greatest joy was the education, progress, and success of his worthy son, recently made professor of physiology at Yale.

No greater tribute to the generous and humanitarian side of John Fulton can be written than the noble and unselfish service he rendered to the poor, by faithful daily attendance upon his clinic at the Wilder Dispensary of St. Paul during the last fifteen years of his life. In fact, his renewed interest and devotion to his profession, and his active participation in all medical societies during these years was an inspiring example for his young colleagues. Nature gifted him with a remarkable constitution and a strong will to overcome sometimes overwhelming obstacles. The younger generation could hardly think of John Fulton as one of the pioneers of medicine because of his alert mind, sustained enthusiasm, and energy right up to the time of his death.

Your committee is privileged to express its deep appreciation of John Farguahar Fulton, whose kindly nature we loved and admired, whose departure fills us with fond memory of valued friendship. We, the benefactors of his early work, admirers of his noble example and his sterling qualities, extend for the medical profession our sympathy to Mrs. Fulton and his son and daughters in their bereavement.

Justus Ohage, Sr.
Wm. Davis
J. T. Christison
Frank E. Burch, *Chairman.*

Orville Whipple Parrott

1863-1932

Mr. O. W. Parrott, Minneapolis, for fifty years active in the publishing business in the Twin Cities, passed away after a brief illness on February 13. Associated with the Bruce Publishing Company and its predecessors in the ownership of the publications of the Commercial Bulletin Company for the past forty-five years, Mr. Parrott had been production supervisor of some thirty-six monthly publications produced in the plant of the Bruce Publishing Company, one of which has been Minnesota Medicine.

It was the privilege of those associated with the publishing of the journal to know Mr. Parrott, and knowing him, even though it was only by occasional contact in connection with the publishing of the journal, was to appreciate the kindly qualities of a gentleman, always accommodating and an expert in his field.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Surgical Errors and Safeguards. Max Thorek, M.D. Surgeon-in-Chief, The American Hospital, Chicago, Attending Surgeon, Cook County Hospital, etc. 696 pages. Illus. Price, $10.00. Philadelphia: J. B. Lippincott, 1932.

Surgical Pathology of the Female Generative Organs. Arthur E. Hertzler, M.D. Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas, etc. 346 pages. Illus. Price, $5.00. Philadelphia: J. B. Lippincott, 1932.

The Story of Medicine. Victor Robinson, M.D. Professor of History of Medicine, Temple University School of Medicine, Philadelphia. 527 pages. Price, $5.00. New York: Albert and Charles Boni, 1931.

Cancer: What Everyone Should Know About It. James A. Tobey, Dr.P.H., Fellow American Public Health Association, etc. 320 pages. Illus. Price, $3.00. New York: Alfred A. Knopf, 1932.

Psychology and Psychiatry in Pediatrics; the Problem. A Publication of the White House Conference. 146 pages. Price, $1.50. New York: The Century Company, 1932.

Body Mechanics: Education and Practice. A Publication of the White House Conference. 166 pages. Illus. Price, $1.50. New York: The Century Company, 1932.

The Principal Nervous Pathways. Andrew Theodore Rasmussen, Ph.D. Professor of Neurology, Dept. of Anatomy, University of Minnesota Medical School, Minneapolis. 73 pages. Illus. New York: The MacMillan Company, 1932.

Sydney University Reprints. Series IX. Medical Sciences (Non-Clinical). Illus. Sydney, Australia: The Australasian Medical Publishing Company, Ltd. 1928-1930.

Koryza. Hermann Ernst. 104 pages. Illus. Vienna, Austria: Druck der Vernay A.-G., 1931.

PHYSICIANS' MANUAL OF BIRTH CONTROL: Antoinette F. Konikow. 245 pages. New York. Buchholz Publishing Co., 1931.

This is a volume of some 230 pages and there is no doubt that the author is very familiar with the use of birth control measures. She enumerates all the various methods in use and gives her opinion of their reliability, convenience and cost. She also gives her method of carrying out birth control measures; her reasons for doing so, and her reasons for not doing so in certain cases.

The third part of her book is devoted to various tables setting forth the various economic factors that have a bearing on this subject and tables showing the various methods used and success obtained as well as the patients' comments. The author reviews the methods and statistics from foreign countries and gives her record of some 500 cases of her own. The book is a complete presentation of the subject.

A. G. Schulze, M.D.

A DOCTOR OF THE 1870'S AND 80'S. Wm. Allen Pusey, A.M., M.D., LL.D. 153 pages. Illus. Price $3.00. Springfield, Ill.: Chas. C. Thomas, Publisher, 1931.

A delightfully written tribute written by a doctor son to his father, also a doctor, who belonged to the preceding generation and who represented the fine type of general practitioner.

The younger practitioner of today could read this volume with interest and would appreciate the hardships of practice fifty years ago when horses and saddle bags were in vogue and bacteriology was unknown, but when the returns for practice were doubtless fully as satisfying as in our day.

C. B. Drake, M.D.

DIABETES DIRECTIONS FOR TREATMENT BY INSULIN AND DIET. Benjamin F. Smith, M.D., D. Appleton & Company, New York. 1930. Price, $2.00.

Another volume for the diabetic patient. The brevity of its instructions recommends it. The great number of daily menus given facilitates the instructions given the patient. The method of substitution of combinations of food for those given in the diets in the reviewer's opinion complicates matters unnecessarily. There is no need for this or additional diabetic manuals.

C. B. Drake, M.D.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

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FOLLOWING UP SANATORIUM PATIENTS*

George Thomas Palmer, M.D.
Springfield, Illinois

REGARDLESS of the brilliant progress in tuberculosis work as shown by the decrease in tuberculosis mortality, one who has followed the anti-tuberculosis campaign closely for a quarter of a century is still rather depressed by three outstanding facts: (a) the continued delay in diagnosis until an advanced and incurable stage of the disease has been reached; (b) delay in seeking sanatorium care until the chances of recovery or material improvement are slight; (c) the excessive rate of reactivation among patients who have been discharged or who have left sanatoria in apparently good condition.

The evidence that we have by no means reached the place we should strive to attain in educational and clinical service leading to early diagnosis, is apparent to every physician and nurse engaged in tuberculosis work and especially to those connected with sanatoria. Despite our educational efforts, the public, and even those who are in daily contact with open cases of tuberculosis, are not yet convinced of the importance of periodic re-examination. So far, we have failed to sufficiently interest the medical profession to the point where we have any assurance that an examination will lead to a diagnosis of active or well advanced disease.

Neither the doctor nor the layman has been impressed with the value and economy, both in human life and money, of early sanatorium care, nor with the usual futility of home care.

At any rate, in this day of self-congratulation and advancement, we still witness the doleful procession of advanced consumptives entering our sanatoria. It is still not unusual to have death occur within a few weeks after sanatorium care is sought or even in the interim between application for admission and the finding of a vacancy. In our own institution, it is still necessary to maintain 60 per cent of our beds as infirmary or hospital beds and 40 per cent as ambulant or semi-ambulant beds.

This gloomy spectacle of failure to secure diagnosis and sanatorium care until death is near at hand, may not be so frequent or conspicuous in certain fortunate and favored localities in the Mississippi Valley where great public interest has been aroused and where unusual public machinery has been created; but, in my own State, at least, these exceptionally favored spots are very few and far between. However, that is not the question that I propose to discuss today.

Someone has said that of curable consumptives, seventy-five per cent lose their chance of recovery after the symptoms of the disease have practically disappeared. The outstanding discouragement of my own twenty years of sanatorium management, is not failure to attain improvement or arrest while the patient is in the institution, but the unnecessarily high percentage of reactivation—the excessive morbidity and mortality—within a few years after leaving the sanatorium.

What I have to say of our efforts to overcome or to prevent this reactivation will not be especially interesting to those who are located in communities where there are ideally operated municipal or county sanatoria with entirely adequate dispensary and visiting nurse service (if there are such comunimties); but our problem is not unlike that of the state sanatoria or others serving a wide area of territory, without competent visiting nurses or other field staff.

The excessive percentage of reactivation and high mortality rate among those who are discharged from sanatoria in good condition may be due to faulty sanatorium education and training, but is more likely due to improper guidance on reaching home, to failure to obtain the cooperation and moral support of the family, and to the restlessness and sense of irresponsibility on the part of the patient. It consequently appears that the most effective course which the sanatorium can follow to assure permanency of its results, is that which will give the greatest influence over the patient while in the institution and that which gives the patient the greatest degree of support and supervision following his discharge.

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*Presented before the Mississippi Valley Conference on Tuberculosis, St. Paul, Minnesota, September 21, 22, and 23, 1931.

In our own sanatorium the foundation for the follow-up or home control of the patient is begun the day he enters the sanatorium. Inasmuch as the later home contact is a job which I have assigned to myself, and which must be the work of one man, I invariably take the patient's initial history, having my Superintendent write the record from my dictation so that she, who will guide the details of his sanatorium life, and I, who will follow him through his illness, may be fully familiar not only with his physical condition, but his temperament, his personality, and his personal and domestic problems. It is almost as important to know what kind of a family the patient has to live with as to know the extent of his pulmonary involvement. An unlimited time is allowed for the initial story and the patient is encouraged to talk freely. A special effort is made to bring out all of those factors in his life which may have contributed to his reduced resistance and the activation of the disease so that these factors may be recognized and guarded against when the patient resumes his home life. The patient is then advised that at any time during his sanatorium stay he is welcome to unlimited interviews as to his physical condition or personal affairs and in these interviews an effort is made to learn still more of the environment and problems which will confront the patient on his discharge. It may require several such interviews before the patient's confidence is won and his reticence entirely overcome.

When the patient is ready for discharge there is a final interview in which all details which will confront him are brought together and made a matter of record and the patient is given a written outline for his home guidance, this outline being prepared for the individual patient with his personal problems thoroughly in view and never in stereotype form.

At this point the further relationship of the sanatorium with the patient is determined by the attitude of the family physician and this is influenced very largely by the close contact maintained with the doctor during the patient's sanatorium care. If it is the desire of the physician that contact with the sanatorium should be terminated and the details of home care left to the patient, the sanatorium follows up the patient only in a purely impersonal way. As a rule, however, the family physician has come to prefer that the sanatorium shall retain as intimate contact with his patient as possible. Under these circumstances, the patient is supplied with temperature and record blanks which are to be filled out and returned to the sanatorium every two weeks and are to be accompanied by a brief note with information as to any unusual symptoms, as to the amount of exercise and any unusual events in the patient's life. He is assured that these will be regarded as confidential. These reports and letters are always answered by a letter more or less in detail, dictated by the Medical Director himself, and copies of these replies are sent to the patient's physician.

In many cases these semi-monthly letters have been exchanged between the patient and the sanatorium for periods of from two to five years and I believe that they have been particularly beneficial at that stage where the patient is ready to resume gainful occupation.

The patient is urged to remain for many months at least under the weekly observation of his physician and to advise us in his semi-monthly letters as to the opinions which the home doctors may express. Incidentally, it is remarkable how much difficulty the patients encounter in securing this prolonged supervision from their home doctors, especially when there is no evidence of acute illness. In such instances, a tactful letter to the doctor frequently alters his attitude.

If the family doctor prefers, as is frequently the case, the patient returns to the sanatorium for periodic reexamination and advice or is referred by the sanatorium to men specializing in tuberculosis in their own neighborhoods. In the latter case, the examining physician is always supplied with a brief case record and information as to the program the patient is following so that he may not be disturbed by what appear to him to be conflicting opinions and radical changes in routine.

A record of the home progress of every patient is kept on file in the sanatorium office and this record is brought down to date on each direct or indirect contact with the patient.

As a means of continuing its influence over discharged patients, the sanatorium publishes a little newspaper called the Palm Leaf which, unlike most of the sanatorium papers, is edited by the Medical Director himself. While this publication contains news items relative to former patients and events at the sanatorium which will prove of interest to former patients, its chief value lies in its continued systematic reiteration of those things which are essential to the patient's recovery and which are most likely to be ignored or overlooked by the convalescent patient. Our files contain scores of letters from former patients assuring us that the regular visits of the Palm Leaf have caused them to adhere more strictly to the program leading toward recovery.

Once in a while the Palm Leaf announces what we call a spiritual homecoming and every patient is requested to write to the Medical Director as to his progress and present condition and each patient is also requested to give the names and present addresses of all former sanatorium patients of whom they have knowledge. In this way the records of former patients may be constantly revised and, whenever a patient is found with whom we have had no contact for several months, a personal letter is written asking for a statement of his present condition.

It is our belief that this correspondence extending over several years with semi-monthly individual letters from the head of the institution containing advice, encouragement and necessary warnings has a decided influence on the action of the patient and a distinct influence on his recovery. The information gained from the patient while in the sanatorium, as to his home conditions, his financial status and his domestic problems, makes this correspondence infinitely more personal, more valuable and more helpful.

While there is no pretense that this method of the follow-up of patients is ideal or even adequate, it is none the less true that, in the opinion of a large group of physicians, this contact is one of the most valuable services rendered by the sanatorium. Its success depends upon the intimacy of acquaintance formed in the sanatorium, definite knowledge as to the patient's personal problems and home conditions and the manifestation of genuine interest in the individual. While this laborious service is rendered entirely without cost, it none the less taxes our ingenuity to sufficiently interest the patient so as to cause him to maintain his contact with the sanatorium over the prolonged period which we regard as essential to the best results.

AN OUTLINE OF SOME OF THE ADVANTAGES AND DISADVANTAGES OF VARIOUS AGENTS USED IN ANESTHESIA*

John S. Lundy, M.D.
Rochester, Minnesota

In considering the advantages and disadvantages of the various agents used in anesthesia one considers primarily the mortality and secondarily the morbidity associated with the anesthetic agent, both during operation and after operation, regardless of whether the outcome, other than in association with the anesthetic, is fatal. In my brief outline of some of the fundamental principles that guide one, in certain cases, in eliminating from consideration certain anesthetic agents, I shall consider, separately, the mortality that occurs during operation and after operation.

The factors of danger and the factors of safety of the various agents are essentially related to their pharmacologic effects, as modified by the method of, and the skill in, their administration as well as by the physical condition of the patient and the requirements of the operation.

PRIMARY CONSIDERATIONS

Immediate untoward results.—The more commonly used of both the new and the old anesthetic and analgesic agents divide themselves into two groups from the standpoint of immediate untoward results: (1) those in which there is little if any margin of safety between failure of the respiration and failure of the heart, and (2) those in which there is a wide margin of safety between failure of the respiration and failure of the heart. In the first group I would place chloroform, ethyl chloride, nupercaine (a-butyl-oxy-cinchonic acid diethyl-ethylene diamide-hydrochloride) and probably cocaine; in the second group, ether, nitrous oxide, ethylene (excluding explosions), procaine, avertin (tribromethyl alcohol) the barbiturates, and morphine.

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*From the Section on Anesthesia, The Mayo Clinic, Rochester, Minnesota. Read at the meeting of the Northern Minnesota Medical Association, Hibbing, September 14, 1931.

Delayed untoward results.—The ordinary delayed untoward reactions which occasionally are associated with the use of certain agents may not be easily classified and probably are best pointed out by first mentioning the agents and then the complications. For example, chloroform causes delayed central necrosis of the lobules of the liver; ether, pulmonary and renal complications, and, if patients have diabetes, probably complications involving the pancreas. With the use of nitrous oxide delayed untoward results are not observed unless they are initiated by increase in blood pressure at the time of operation. Not infrequently anoxemia is seen during anesthesia with nitrous oxide. With the use of ethylene, delayed untoward reactions should not occur, unless, because of the inflammability of the agent, a burn has been produced which may later cause death. Ethyl chloride usually does not cause delayed untoward results. Early in the use of avertin colitis developed from its improper application, and patients with pulmonary tuberculosis and cavitation were unfavorably affected. In one case a diabetic patient suffered considerable postoperative shock which in my opinion was due to the avertin.

Delayed untoward results associated with local anesthetics must in part be associated with the trauma of the needle which introduces the agent into the body. For example, headache following lumbar puncture must naturally be expected in cases in which anesthetics are given intraspinally; in some instances the spinal cord may be traumatized, although this must occur rarely. Characteristic pharmacologic effects of the common local anesthetics would lead one to believe that they are not lasting if ordinary doses are used. However, this depends, to some extent, on the concentration of the solution used, and probably, also, on the condition of the nerve cells that make direct contact with the anesthetic. Respiratory embarrassment is associated with large doses of morphine, or of a barbiturate, or both. Pulmonary complications are common following an overdose of a barbiturate with or without morphine. Blood pressure may be lowered and the circulation of the blood slowed, which would tend to the formation of thrombi and emboli. As a rule the danger incident to the use of these agents is more or less proportionate to the dose employed. Under the term "balanced anesthesia," I have previously called attention to the advantage of using a small dose of two or more of these agents.

SECONDARY CONSIDERATIONS

The less significant advantages and disadvantages incident to the use of the various anesthetic agents also hinge on certain essential principles. These have to do with the answer to one or both of two questions: Does an anesthetic or special method of administering an anesthetic make an operation easy or easier than others? Is the use of a certain agent contraindicated by the disease or diseases present? In some cases relaxation is essential to the successful outcome of the operation, and, if other conditions permit, it may be advantageous to use spinal anesthesia, some form of regional block anesthesia such as sacral or brachial plexus block, or ether by the open-drop method. If relaxation is not essential, the gases, with or without ether, or local infiltration may be used. Often the quiet breathing associated with intratracheal anesthesia may be as advantageous as relaxation.

The disease conditions presented by patients are numerous, and a few only can be mentioned here, although they are important in the choice of the anesthetic. In the presence of active pulmonary disease, such as tuberculosis or bronchiectasis, an inhalation anesthetic which tends to irritate pulmonary tissue, such as ether, should be avoided, and gas used instead. However, if relaxation is necessary in such cases, spinal anesthesia may be resorted to for operations below the diaphragm, and for operations above the diaphragm some method of regional block or infiltration anesthesia might be used. In either event, gas may be added if the local or spinal anesthesia is insufficient.

If the patient has diabetes it is often wise to avoid the potent general anesthetic agents which tend to depress the functions of certain organs, and also to avoid the use of agents which must be destroyed in the body or excreted from it by organs which, because of disease, do not carry any additional burden well. Drugs, such as the barbiturates, are destroyed within the body or eliminated from it other than by way of the lungs, and continue to act until they are destroyed or eliminated; and so, their use is unwise in certain cases in which the functions of organs are seriously impaired. Avertin, too, theoretically may be contraindicated in certain conditions in which organic function is seriously impaired, especially in cases of advanced hepatic and renal disease. The admixture of epinephrine and local anesthetic is not advisable in the presence of hypertension or exophthalmic goiter. It is obvious that inflammable agents are contraindicated if the cautery or other devices which might ignite the anesthetic agent are to be employed. There are certain conditions, such as intrathoracic tumor, which require opening the thorax, and in which pulmonary ventilation and anesthesia must be accomplished simultaneously. In such cases satisfactory results may be more easily obtained if an intratracheal tube is used; the anesthetic is thus administered with oxygen. For many operations, especially plastic operations about the head and neck, the intratracheal method of anesthetization makes the work of the surgeon and the anesthetist easier. Since carbon dioxide increases the coagulability of the blood, patients who tend to bleed and whose clotting time may be delayed may benefit by the addition of carbon dioxide to the anesthetic mixture. This, however, is one of the least of the functions of carbon dioxide; at present this gas is used extensively to control the depth of respiration, to control nausea during spinal anesthesia, to control hiccough following operation, and to hyperventilate the lungs following operation, regardless of whether respiratory embarrassment has come about from overdose of an anesthetic agent or from the extreme effects of morphine or a barbiturate, or both.

Agents and methods available at the present time make it possible to avoid a practice which will probably be unsatisfactory, that is, the use of any anesthetic agent or method as a routine.

THE POCKET FLAP

THE SAFEST METHOD FOR EXTRACTION OF SENILE CATARACT*

Charles Nelson Spratt, M.D.
Minneapolis

IN Les Miserables, Victor Hugo vividly describes the panic that seizes the traveler who, walking along the sea shore at low tide, discovers that he is lost in the quicksands. A similar feeling often overwhelms a patient when told that he has a cataract. The thought of oncoming blindness to many is as terrible as death itself. If the diagnosis is correct and the loss of vision is not due to glaucoma with a hazy lens (often called cataract by the public) a cataract operation offers the greatest hope for the recovery of vision, if the fundus is normal.

From the patient's point of view the restoration of vision, and not the technic or method to be used, is the important problem. What operation will prove the safest and offer the least chance of loss of the eye, the recovery of useful vision, the shortest convalescence, the least postoperative discomfort? It is said that Barraquer, when asked what operation he would choose had he a cataract himself, stated that he would have it done by the intracapsular method, provided he were the operator. If he were not, he would prefer the capsulotomy operation. If the same problem were presented to any other ophthalmologist, I think that he would select the operation which he considered the safest, the one followed by the least number of failures.

The removal of the lens in capsule, which, according to Wood,[1] was first performed by Samuel Sharp of London in 1753 and advocated by Smith, Pagenstecher and Barraquer, is an ideal procedure in that no cortex or capsule remains to cause irritation. Certain operators, such as Smith and Barraquer, acquire a technic that possibly makes the intracapsular operation as safe as the capsulotomy method.

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*Presented before the Section on Ophthalmology of the American Medical Association. Permission for publication obtained from the American Medical Association.

Statistics of excellent operators show that the intracapsular operation is followed by a greater percentage of loss of vitreous than when the capsulotomy operation is done. Zentmayer[2] reports in Smith's 17 operations in Philadelphia a 38 per cent loss; Birdwood[3] gives a 35 per cent loss in 311 operations; Elschnig[4] reports a 2 per cent loss in 144; Dunphy's[5] series at the Massachusetts Eye and Ear Infirmary shows a loss of 18.8 per cent in 441 cases; he also gives Derby's loss as 2 per cent in 200; Husain,[6] 11 per cent in 737 cases; Parker,[7] 18.8 per cent in 100 cases. The statistics of the capsulotomy operation show a much smaller loss of vitreous. Birdwood, in 1,585 cases, had a 10 per cent loss; Ellett,[8] in 600 cases, a 7.6 per cent loss; Dunphy, at the Massachusetts Eye and Ear Infirmary, in 1,821 cases, a 7 per cent loss; Parker, in 1,421 cases, 10 per cent loss; Graefe, as quoted by Barkan,[9] in 669 cases, 2.8 per cent; Ring (collected), in 1,123 simple extractions, 3.9 per cent; Ring (collected), in combined extraction, 6.9 per cent.

I believe that the loss of vitreous is a complication that should and can be avoided, since poor vision and a soft eye with ultimate loss may result. Dunphy has followed fifty cases in which a loss of vitreous occurred and reports that good vision (from 20/20 to 20/30) was obtained in 40 per cent; fair (from 20/40 to 20/50), in 22 per cent; poor (from 20/70 to 20/100), in 18 per cent, and bad (20/200 or less), in 20 per cent. In a rather humorous style, Fradkine[10] speaks of loss of vitreous as not a dangerous accident. He is inclined to think that this leaves a cleaner vitreous, as the cortex and capsule are washed out. This view is not held by other operators.

The operation that has given me the greatest number of successes, the most rapid healing, the shortest convalescence, and which I believe to be the safest operation, is the suture pocket flap method. This is a modification of the Husain flap operation, which in turn is a modification of the Czermark. The method of Husain was called to the attention of the American profession by W. Holbrook Lowell.[11] This consists in making an opening in the conjunctiva about 1 cm. above the sclerocorneal margin. The conjunctiva is dissected to the limbus, and an opening is made with a keratome into the anterior chamber beneath this flap. This incision is enlarged on each side with scissors. The lens is extracted in capsule after an iridectomy. No suture is used unless vitreous is lost.

In May, 1928, I[12] published a description of an operation with a report of fifty-two cases. The method described in that article has since been followed without change.

PREPARATION

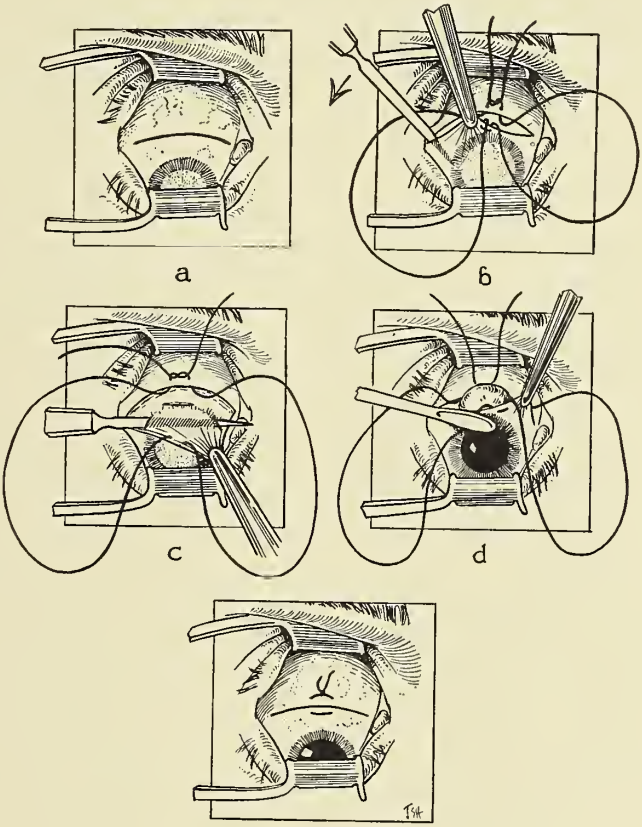
The patient is given 20 grains (1.3 Gm.) of barbital or 10 grains (0.65 Gm.) of phenobarbital four hours before the operation and the pupil is dilated with 1 per cent atropine. The operation is done on the patient's own bed or on a stretcher. The skin is washed with full strength hexylresorcinol solution S. T. 37. Anesthesia is produced by four instillations of 4 per cent cocaine at four minute intervals. Subconjunctival or Van Lint injection of the lids with procaine hydrochloride, or paralysis of the orbicularis muscle by the injection of the facial nerve as suggested by Dilliard,[13] have not been made, nor have I used deep orbital injections, as this method is not entirely free from danger. Brusselmans[14] reports a case of cellulitis following deep orbital injections, and McCannel[15] has had a fatal case of cavernous sinus thrombosis.

Many writers seem to think that the orbital injection of a local anesthetic is a recent idea. It may be of interest to quote the suggestion of Halstead in 1884, reported by his assistant Hall:[16] "In addition to the usual application to the conjunctiva, in operations on the eye, an injection into the orbit, in the neighborhood of the ciliary nerves, would doubtless diminish the liability to a very grave accident, . . . namely, in extrusion of the lens, from blepharospasm, occurring during iridectomy performed with the aid of cocaine." It may be noted that Halstead was also the first to use cocaine as an anesthetic by intradermal injection and nerve blocking, and as an injection of the maxillary nerves for the extraction of a tooth.

A double thickness of moist gauze is placed over the entire face. This prevents the suture, hands and instruments from coming in contact with the skin. A speculum with solid blades is inserted. The conjunctival sac is irrigated with hexylresorcinol solution S. T. 37, diluted with 3 or 4 parts of water. Epinephrine is dropped into the eye to cause blanching of the conjunctiva.

OPERATION

A horizontal incision from 1.5 to 2 cm. long and 5 mm. above the limbus is made in the conjunctiva (*a* in the illustration) with small blunt pointed scissors. In cases complicated by glaucoma, where a Lagrange operation is indicated, it is better to make the horizontal incision from 7 to 8 mm. above the limbus. The wide flap is less likely to be followed by separation of the wound. The conjunctival flap with the episcleral tissue is dissected downward to the limbus and extensions are made on each side so as to expose the upper two-fifths of the circumference. If the hemorrhage is troublesome, a small pledget of cotton saturated with epinephrine is placed in the pocket. A mattress suture of 000 black silk in a small round full curve needle is now placed in the center of the edges of the conjunctival wound (*b*). The thread is drawn to each side, forming large loops, and a single knot is made. As the eyeball has not been opened, this can be done safely and easily. One also has definite information as to the behavior of the patient for the rest of the operation. Should he prove to be a "squeezer," the orbicularis muscle may be injected as suggested by Ván Lint, or a canthotomy performed. This is necessary in only a few cases.



Details of pocket flap.

The rest of the operation, which includes the opening into the globe and the removal of the lens, is done in a sterile field. The possibility of an infection following this method (either at the time of operation or postoperatively), when compared to the opening of the eye with the classic incision at the limbus, is reduced to a minimum. The operator, standing at the patient's head, holds the flap at the temporal portion with a pair of anatomic forceps. The point of a slender, tapering knife is placed beneath the conjunctiva in the pocket on the temporal side. The knife is held in the right hand when operating on the right eye and in the left hand for the left eye. The puncture is made at the limbus as in the ordinary extraction. The handle of the knife is depressed, and the counterpuncture is made directly opposite. Fixation is secured by holding the conjunctival flap. The forceps are transferred to the nasal part of the flap, which is then turned down over the cornea and away from the point of the knife, thus avoiding the danger of a buttonhole in the conjunctiva (*c*). The incision includes the upper two-fifths of the limbus. The anterior chamber is not evacuated until the incision is nearly completed. The taper of the knife and the conjunctiva overlapping the puncture and the counterpuncture prevent the escape of aqueous. By making a long bevel at the upper portion of the incision so as to include the sclera, a Lagrange operation may also be performed, if indicated.

If the iris is rigid, the sphincter is cut, or if it tends to prolapse, a small iridectomy is made. The anterior capsule is removed with forceps, and the cataract is expressed in the usual way by the application of pressure with a blunt spoon below at the limbus, the flap being held forward and up by the forceps (*d*). This maneuver elongates the globe, separates the wound edges, thus allowing easy extraction of the lens, and tends to prevent loss of vitreous. Any blood or cortex in the anterior chamber is removed by irrigation with Locke's solution or physiologic solution of sodium chloride. Should vitreous appear, the ends of the suture are drawn tight and the wound is immediately closed (*e*), thus preventing any loss. Irrigation is usually done before the suture is tied but may be done afterward, if necessary. Replacement of the iris can be done either before or after tying, by means of a spatula inserted on the opposite side of the central suture. If the patient has difficulty in looking down, or is unruly, or if the conjunctival flap is very thin and apt to be torn, perfect fixation can be secured by a suture in the superior rectus muscle. No assistant is employed during the operation except to hold the suture.

A light dressing is put over both eyes and a shield over the one that is operated on. The patient may sit up with a back rest. Iris prolapse from turning in bed, vomiting or postoperative delirium is not to be feared, as the wound is closed by the tight suture. If the iris is caught in the wound, this iris inclusion serves as a preventive against glaucoma.

Daljang Singh Khana,[17] who performs intracapsular extractions without iridectomy, advises the patient to sit up and not lie down for six hours, in order to guard against iris prolapse. He states that in the prone position the aqueous collects in the anterior chamber and makes the iris float upward, and as the wall is weak at the incision, the pressure all round the iris tends to bulge it out at the base into the incision and thus favors prolapse. In the sitting position, the aqueous fills the anterior chamber from below and its level rise is gradual; thus there is fluid on both sides of the iris, which hangs like a vertical curtain.

The next morning the eye is dressed, 1 per cent atropine is instilled, the bandage is replaced and the patient is allowed to sit up in a chair. On the second day 1 per cent atropine is used twice and the eye that was not operated on is left uncovered. All dressings are removed on the fourth or fifth day. The suture is easily removed at any time between the fifth and the ninth day. Patients are allowed to leave the hospital on the third to the seventh day, depending on the distance to their homes. Several patients have had the two eyes operated on at the same time.

In old persons with atrophic conjunctiva, the flap may be torn as the result of traction or the insertion of the needle. Fixation of the eye with a suture in the superior rectus muscle will avoid the former and the use of a round needle will prevent the latter complication. In eyes with shallow anterior chambers, the flap may be buttonholed because of the counterpuncture being made too far forward. The conjunctival flap should be dissected to the limbus. To indicate the exit of the knife, a shallow nick may be made in the sclera. In the earlier cases, my tendency was to make the incision rather far back in the sclera, as in the Lagrange operation. More bleeding occurs with this incision and there is danger of cutting the iris, thus making an iridectomy simultaneously. In shallow anterior chambers this may be almost unavoidable, but it is an advantage as the lens is more easily delivered, and the combined extraction is safer than the simple.

Most of the patients (80 per cent) went home in a week or less. Those who lived at a distance or were handicapped by having only one eye were kept longer. Many left the hospital on the second day with safety, as a result of the tight union of the sutured flap.

This operation is the application of the general surgical principle that, unless drainage is indicated, tight closure of a wound by layers of tissue is to be made. It is not to be confused with the ordinary sutured conjunctival flap described by Williams, Wurdemann, Kalt, Verhoeff, Elschnig and others, as in these methods the angles of the wound are open and not protected by conjunctiva.

RESULTS

I have done the pocket flap operation on 196 eyes. Fifty-two of the operations were reported in a previous paper.[12] Ninety-nine of the patients were men and 97 were women. The right eye was operated on 96 times and the left eye 100 times. The simple extraction was done 114 times, the combined operation 82 times.

TABLE 1.—AGES

Ages	Cases
30 to 40	5
40 to 50	12
50 to 60	36
60 to 70	63
70 to 80	61
80 to 90	17
95	1
96	1
Total	196

The ages by decades were as given in Table 1.

The days in the hospital are given in Table 2; 156 patients (80 per cent) were in the hospital seven days or less.

TABLE 2.—DAYS IN HOSPITAL

Days	Cases	Days	Cases
1½	3	8	9
2	10	9	3
3	34	10	5
4	41	11	2
5	17	12	5
6	28	13	5
7	23	14	4
		16	2
Seven days or less..	156	17	1
		18	2
		19	1
		31	1
		More than seven days	40

The astigmatism was as given in Table 3.

Glaucoma was present in ten cases. The vision was as follows: 5/4, two; 5/5, one; 5/6, one; 5/7, one; 5/9, one; nil, four.

There were six patients with diabetes. The vision obtained was as follows: 5/6, one; 5/12, two; 5/9, one; nil, two.

TABLE 3.—ASTIGMATISM

Diopters	Cases
None	12
0 to 1	30
1 to 2	56
2 to 3	39
3 to 4	29
4 to 5	8
5 to 6	2
8 to 9	2
12	1
Unknown	16
Total	196

Among the 196 cases, 11 were excluded as there was light perception only, with faulty projection, and the operation was not justified except for cosmetic reasons, or in the hope that some slight vision might be obtained.

The complications in the eleven cases not included in estimating vision, but in which good operative results were obtained, was as follows: glaucoma, four; detachment, one; diabetes, two; optic atrophy, three; intraocular foreign body, one.

TABLE 4.—VISION

	Number of Cases	
5/3	16	
5/4	60	
5/5	42	
5/6	20	
5/7	14	
5/9	12	
5/12	10	
5/15	2	Senile vitreous changes
5/22	1	Optic atrophy
5/30	1	Leukoma of cornea
5/50	1	Vitreous changes
Lost eye	3	
Unknown	3	
Total	185	

The vision was as given in Table 4.

In this series of 185 extractions, 174 patients, or 94 per cent, obtained vision equal to 5/12 or better. Among the latter, normal vision of 5/5 was present in 118 cases, or 63.7 per cent. The vision of three patients is unknown. Owing to their physical condition and distance of residence, they did not return for visual tests. One, aged 96, had sufficient vision to recognize persons; the second had high myopia; the third, aged 84, had choroidal changes. The latter had vision of 5/9 in the other eye following a previous extraction. The patient with 5/50 vision had vitreous opacities with posterior synechia due to a severe iridocyclitis one year previous.

COMPLICATIONS

In this series, three eyes were lost. A choroidal hemorrhage occurred on the fourth day in a myopic eye. This eye was later removed on account of pain due to increased tension. The wound remained tight and there was no leakage of blood. This demonstrates the firmness of the union.

Iridocyclitis caused the loss of two eyes. In one patient, a woman, aged 84, the flap was buttonholed or torn. An iris prolapse occurred through this tear as in the ordinary limbal incision. An iridocyclitis developed on the ninth day, resulting in loss of vision. This could have been prevented had an iridectomy been made, and this complication would not have occurred had there been a perfect flap; therefore it should not be classed as a pocket flap operation. A second case was in a woman, aged 78, who had diabetes. The operation on her other eye was successful.

There were five cases of slight subconjunctival iris prolapse.

Two cases of secondary glaucoma developed. These quieted down with resulting good vision.

In twenty-seven cases, a secondary cataract was divided, with improvement of vision.

In the entire series, vitreous presented twelve times. Owing to the immediate closure of the wound by the suture there was an actual loss in only five cases. In four of these, the lens was extracted with the loop.

Vision in cases in which vitreous appeared or was lost was as follows: 5/4, three; 5/5, two; 5/7, three; 5/9, one; 5/15, one; nil, two (glaucoma); total, 12.

DISADVANTAGES

There are two disadvantages to this operation. The first, suggested by Crisp,[18] is a lack of visibility in making the incision. This is more theoretical than real, as the flap can be manipulated so that there is no difficulty in making the puncture and counterpuncture. The second is that more hemorrhage occurs than in the ordinary incision. As the wound is closed by the suture, this blood goes into the anterior chamber rather than into the conjunctival sac. This hyphema is of no significance and clears up in a few days. Other objections, such as the length of time of the operation and the difficulty of removing the silk, could be raised against any sutured incision. The time is well spent if five minutes longer in the operating room will save the patient five days in the hospital. The removal of the suture from the eye does not involve any difficulties.

ADVANTAGES

The advantages of the pocket flap operation are as follows:

1. It offers the least possible chance for infection, as the operation is performed in a sterile field quite separate from the conjunctival sac.
2. With the use of the conjunctival flap as a means of fixation there is less danger of vitreous prolapse, as the traction on the flap causes an elongation of the eyeball and a separation of the edges of the wound; thus the lens is more easily expressed.
3. The suture may at any time be drawn tight to prevent vitreous escape.
4. The insertion of the suture previous to the making of the incision is done with safety. If the patient shows evidence of being a "squeezer," a canthotomy may be done or a suture may be placed in the superior rectus muscle in order to obtain fixation of the eye.
5. In case there is increased tension and a Lagrange operation is advisable, both an extraction and a sclerectomy may be done.
6. Healing takes place in a few hours, the patient may sit up the same day, and he may walk around with the eye covered the second day.
7. As the cornea is not cut, there is no danger of epithelium growing into the wound. In cases in which the incision had been made at the limbus or in the cornea, I have seen a patient with an ununited wound up to thirteen days.
8. After using a sutured pocket flap, the surgeon has the satisfaction of knowing that the patient is practically out of danger of prolapse and infection and that healing will take place immediately. There are several cases in this series in which the eye would have been lost if the large flap had not been used.
9. The vision in uncomplicated cases is as good as or better than that obtained by the small flap incision, as there is less astigmatism in the majority of cases and less striped keratitis.
10. Nausea and vomiting after cataract extraction are without serious consequences, as the sutured flap is a positive safeguard against iris prolapse. Law[19] has collected from Moorfields 141 cases of cataract extraction with vomiting in fifteen. There were ill effects in five of these and actual iris prolapse in two cases.
11. Should postoperative delirium occur, a sutured conjunctiva is a factor of great advantage as there is slight risk of a ruptured wound. In my experience, delirium has occurred but once in 800 operations.
12. A prolonged confinement in bed is not only uncomfortable to old persons but also subjects them to the danger of hypostatic congestion. With the sutured flap, this possibility is en-

tirely avoided, as the patient may with safety sit up immediately after operation.

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LARYNGEAL EMERGENCIES IN INFANTS AND CHILDREN*

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OBSTRUCTION of the larynx is an emergency. The degree of the emergency depends upon the extent and suddenness of the obstruction. There are instances where complete obstruction develops so quickly that death occurs before any medical aid can be secured. In any case, treatment should be immediate upon the establishment of the diagnosis. The nature of the obstruction determines the therapeutic procedure, as all cases of acute laryngeal obstruction should not be treated in the same routine manner.

The etiology of acute laryngeal obstruction was clarified enormously by the discovery of bacteria. Differentiation, particularly of lesions due to diphtheria infection, made a more definite classification possible. The next great advance was the invention of the direct laryngoscope. By its use, we are able to examine the larynx of a child suffering from laryngeal symptoms. By direct vision we are enabled to locate the point of obstruction, whether sub- or supraglottic. We can see a membrane, the motility of the vocal cords, the presence of secretion, edema, foreign bodies, or congenital defects. I know of but few contraindications to a direct laryngoscopic examination. I have performed it in many homes without difficulty, for it is not necessary that the patient be in a hospital for this examination. With such an examination there should be very little misunderstanding concerning the etiology of acute laryngeal obstruction. But that such is not the case is demonstrated by the persistence in textbooks on both pediatrics and laryngology in retaining the outworn terms "spasmodic croup," "false croup," "thymic croup," as synonyms of acute laryngitis or laryngismus stridulus. Coakley's textbook, published in 1930, states (page 587) "in infants no examination of the larynx can be made owing to the age of the patient," and again (page 494) "it is seldom possible to examine the larynx of a child." Richards[1] asserts, "Called to the home in a case of sudden and severe obstruction, the laryngologist must of necessity rely on tracheotomy or indirect intubation," implying that laryngoscopy cannot be satisfactorily performed in a home.

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Acute laryngeal obstruction in children may be classified as follows:

1. Congenital malformations
    a. Webs
    b. Absent tracheal rings or collapse of trachea
    c. Exaggerated infantile larynx with collapse (stridor)
. Birth injuries
    a. Dislocations
    b. Paralysis
3. Edema
    a. Primary
        1. Angioneurotic
    b. Secondary
        1. To lesions in the neighboring structures
        2. To general diseases
        3. Post-bronchoscopic
4. Inflammations
    a. Non-membranous
        1. Acute laryngitis, non-streptococcic
        2. Acute laryngitis, streptococcic
    b. Membranous
        1. Diphtheritic
        2. Non-diphtheritic
        3. Vincent infection
        4. Scleroma
        5. Crusts in laryngitis sicca
5. Neuroses
    a. Paralysis
        1. Central
        2. Peripheral
    b. Spasm
        1. Central
        2. Peripheral
6. Laryngismus stridulus
7. Foreign body
8. Tumor

Acute laryngeal obstruction, no matter what the cause, presents certain symptoms. Much valuable information may be gained from a comprehensive history, including information as to inoculation against diphtheria checked by the Schick test and by a general survey of the patient, including his temperature, pulse and respiration. If an X-ray is available, a plate should always be taken before laryngoscopy. Cultures and other laboratory findings should be obtained if time and facilities permit.

Inspiratory stridor is usually the first symptom observed. If extreme, it is accompanied by substernal retraction and the use of the accessory respiratory muscles. A high degree of restlessless soon occurs, and if allowed to continue long results in fatigue. Fatigue is a positive indication for immediate relief.

Cyanosis is not always present. It should not be the factor that determines interference. It may be present when an acute, complete obstruction occurs, or in the late stages of an incomplete obstruction. After cyanosis develops, the prognosis is less favorable.

Hoarseness is a valuable sign in determining the degree of obstruction or the presence of a membrane. Aphonia occurs at times.

Temperature indicates inflammation, while its absence suggests a foreign body, or laryngismus stridulus.

If none of these symptoms are severe, then no emergency exists and delay is justifiable. Should there be doubt, a direct laryngoscopy is indicated. This is much better than palpation, intubation or tracheotomy. Mirror laryngoscopy should be attempted when there is a chance of success, but the direct method can always be used.

The larynx in children has several peculiarities which should be understood before any examination is made. Some of these are responsible for the greater frequency of laryngeal emergencies in childhood.

The larynx is at a higher level in infants than in adults. The epiglottis is opposite the first cervical vertebra during late fetal life and the first year of infancy. It descends the distance of two vertebræ between the first and thirteenth years. The inferior margin of the cricoid cartilage is opposite the third vertebra at birth and descends to the level of the sixth cervical vertebra.[2]

The fact that the respiratory rate is higher in infants causes the respiratory function of the vocal cords to come into play more frequently. The relatively greater size of the tongue for sucking and the normal predominance of nasal breathing in infancy make mouth breathing more difficult for the infant than the adult.

At birth, one-half the glottic boundary is composed of vocal cord and one-half by the arytenoid vocal process. The process really projects into the cord and further reduces this soft fold. At the age of six the cord constitutes more than half the glottic boundary and at puberty two-thirds.

During the first three years the larynx grows rapidly; the next three years, less rapidly; and from six until puberty, quite gradually.

The larynx at birth is funnel shaped, the relation of a cross section of the glottis to that of the trachea being five to one. This funnel shape makes the importance of subglottic swelling much greater.

The cricoid plate tips backward as does the epiglottis, making the laryngeal orifice dorsal and at nearly a right angle to the axis of the trachea. The upper orifice is relatively narrow laterally. The cartilages are softer and make the possibility of collapse more likely.

The mucous membrane is more vascular and looser, especially in the subglottic region. The lymphatics are richer and there is much greater reflex irritability of the larynx.

Congenital anomalies of the larynx are not common. A lesion producing stenosis of the larynx at birth is usually incompatible with life. The most common symptom of congenital abnormality, in my experience, is the "congenital stridor." This condition is characterized by a croaking sound on inspiration without cyanosis or dyspnea. It is present at birth and usually disappears in the second year. The laryngoscopic picture is usually that of a curved, soft epiglottis with aryepiglottic folds so near together that they close the upper orifice of the larynx like a valve. This condition is thought to be purely anatomical by some, while others hold that it is due to an incoördination of the respiratory movements of the larynx and that it is central in origin. Those favoring the neurosis idea point to cases which develop after birth, and in which the stridor is absent while the baby sleeps.

CASE REPORTS

Case 1.—A baby, twelve months old, referred by Dr. Glenn Matchan, had breathed noisily since birth, this stridor having been inspiratory and not associated with hoarseness nor cyanosis. He was undernourished and nursed poorly. X-ray of the chest demonstrated a fairly large thymus. Direct laryngoscopy revealed the false cords and aryepiglottic folds pulled in at each inspiration. A bronchoscope was inserted and no tracheal compression found. A diagnosis of congenital stridor was made and a good prognosis given and the baby was taken home. Two months later he had some difficulty in feeding, butthis soon cleared up and he gained sixteen ounces in a few days. Then suddenly he had such severe laryngeal obstruction that death occurred before a doctor could reach him (thirty-five miles in the country).

Webs of the larynx occur in the newborn, but rarely cause enough obstruction to create an emergency. I can find no case recorded which required tracheotomy. This is the only fatal case of congenital stridor I have seen.

Inspiratory collapse of the esophago-tracheal party wall into the trachea occurs occasionally at birth and may be responsible for serious symptoms, as in the following case:

Case 2.—A newborn, referred by Dr. Rood Taylor, was a "blue baby" at birth and suffered from attacks of cyanosis at intervals. Two other children in this family had died at birth from congenital defects of various types. On examination the larynx seemed normal. The trachea closed on inspiration from a collapse of the party wall. No other abnormality was found. The infant lived but a few days. Autopsy showed a normal larynx. There were very few tracheal rings present and these were smaller than normal, thus accounting for the tracheal collapse.

Severe birth injuries involving the larynx are rare. I have had no experience with this condition.

Edema of the larynx in children from renal or cardiac disease is rare. The treatment of the underlying disease is of most importance. The laryngeal emergency is usually slow in development and adequate preparation for its treatment can be made. Puncture of the edematous area should be tried repeatedly, before tracheotomy is attempted.

Edema of angio-neurotic origin may occur in children. It may be the only sign of the disease, though more often there is a history of swelling of the lips, eyelids, or other parts. The family history should be investigated. The onset is usually sudden without preceding symptoms. The temperature is not elevated and death may occur before a physician arrives.

Laryngoscope examination shows a marked swelling of the arytenoids and aryepiglottic folds as well as of the epiglottis. The vocal cords are not involved. The swelling is whitish as a rule and does not give the appearance of serum below the mucosa. In texture it looks rather firm. Jackson recommends early tracheotomy as the edema is apt to persist. However, some cases do well after adrenalin is given subcutaneously as in the following case:

Case 3.—A boy, aged 6, was referred by Dr. F. J. Kucera. He felt perfectly well and was playing out doors when suddenly his breathing became difficult and he became cyanotic. There was no history of a foreign body. An injection of adrenalin was given by Dr. Kucera and the patient was hurried into the city (about ten miles). The child's stridor could be heard as he came down the hall to my office. A mirror examination was made and a marked edema of the epiglottis and arytenoids was seen. The child was so much better when he reached town that no tracheotomy was done. The edema cleared up in a few hours and no further attacks have occurred.

Post-bronchoscopic edema occurs in small children, even after careful use of the smallest tubes. I have had many such cases after the extraction of an organic foreign body, such as a peanut. As it is likely to develop within the first forty-eight hours, the patient should remain in the hospital for that length of time. If the foreign body has been in the bronchus any length of time, and a drowned lung is present, the postoperative laryngeal obstruction is not entirely edema, but may be due in part to lack of drainage of the thick secretion. In such a case I do a tracheotomy, but otherwise I have found intubation to be quite satisfactory. I allow the tube to remain for two or three days and then remove it. If obstruction persists after two extubations, I perform a tracheotomy.

The intubation is sufficient usually because there is no infection, but merely a traumatic swelling. I have found it necessary to follow intubation with tracheotomy in but a few cases.

Edema secondary to disease of the neighboring structures is a very serious condition. The patient is usually suffering from the toxemia of the original infection and is not able to withstand the added burden of respiratory obstruction. Relief must be prompt and radical measures are indicated early. The primary condition must be relieved if possible and if the secondary edema does not promptly subside, tracheotomy should be done. Intubation is not satisfactory, as the tube may be buried in the swollen tissue or it may be below the obstruction and thus be shut off just as the larynx was.

The following cases illustrate this type of edema:

Case 4.—A baby fourteen months old referred by Dr. M. Seham had had a sore throat associated with temperature and dysphagia for three weeks. These persisted and the baby lost considerable weight. Dr. Seham diagnosed retropharyngeal abscess one week before I saw the patient and advised its evacuation. The parents waited but finally brought the baby in. He was in bad shape, breathing with much difficulty and seemed to require emergency treatment. The abscess was incised with no anesthetic and a large amount of pus removed by suction, but the child stopped breathing. A bronchoscope was inserted at once and after several minutes respirations started. Oxygen was given for about six hours through the bronchoscope and finally the baby breathed fairly well. The next day an intubation tube was inserted and breathing was good for two and one-half days, after which cardiac failure resulted in death.

Case 5.—A boy, seven years of age, referred by Dr. E. D. Anderson, had a sudden attack of sore throat with marked malaise and temperature of 101 degrees. He was very toxic from the onset of his illness. The cervical glands on the right side became involved and one week later a swelling appeared in the region posterior to the right tonsillar fossa. This swelling became soft and fluctuant, so it seemed advisable to drain the abscess. Under gas anesthesia it was incised and suction used. Respirations became labored and it was necessary to use artificial respiration for about three minutes before breathing became natural. A tracheotomy was done to prevent possible recurrence of respiratory obstruction. Recovery was normal, with the exception of a persistently contracted right pupil, and a temporary paralysis of the right half of the palate.

Case 6.—An eight year old girl, referred by Dr. N. O. Pearce, had always been unusually healthy, but was suffering from a mild sore throat of twelve hours duration. Early the next morning she awoke on account of marked dyspnea. She became cyanotic and seemed to be in an alarming condition. She appeared very toxic, her temperature was 104 degrees and there was an acetone odor to her breath. A direct laryngoscopic examination was done at home and an enormously swollen epiglottis and very acutely inflamed lingual tonsils were seen. She was sent to the hospital and preparations made to perform a tracheotomy if necessary. Her general condition improved rapidly after she was given fluids, and her local laryngeal symptoms subsided in about three days. A stiff neck persisted for nearly two weeks, when complete recovery resulted.

Edema from abscess of the larynx is not uncommon in infancy, according to Jackson.[3] The laryngoscopic picture of acute inflammation, plus swelling, is quite definite. McIntosh and Nichol[4] report five cases of abscess of the larynx in infants, and state that laryngoscopy was of no value in localizing the lesion. All cases were opened externally. In one case the abscess was found during a tracheotomy. Aphonia was present. This group of cases is very interesting, but I am at a loss to understand how a larynx, obstructed to such a degree, could show nothing on laryngoscopy.

Abscess of the larynx results frequently from the use of X-ray or radium in treating papillomata. Overexposure produces necrosis of the laryngeal cartilages and abscess results.

Inflammation.—Acute laryngitis in children is frequently quite different from the same condition in adults, largely because the anatomical peculiarities above described predispose to the production of spasm. It is associated with dyspnea, frequently of sudden onset and occurring, usually, at night. The child goes to bed feeling well except for a mild coryza and awakens in an alarming attack of laryngeal obstruction. This is what most people mean by "croup," which the textbooks insist upon calling "true croup." The obstruction may be both expiratory and inspiratory and retraction is present in varying degrees as well as cyanosis. There is hoarseness but not aphonia and the temperature is elevated. Cough is usually present and of a metallic character.

The attack is over as a rule before a physician arrives. I have asked several pediatrists if they ever saw such an attack and usually they say, "When I was young I used to get out of bed and hurry to such a case, but I never got there in time. Now, I tell them to use steam inhalations and let me know what happens. I also tell them the attack will recur the next two nights."

These attacks are said to occur more frequently in children with infected tonsils and adenoids. If so, croup should be listed as an indication for tonsillectomy. It seems also that there is a constitutional type of child that is more susceptible to croup.

The etiology of croup is variable. It may be that when the child goes to bed the recumbent position, with a congested nose, tends to mouth breathing. This dries the secretion in the larynx and small crusts form on the mucous membrane causing irritation and some obstruction. The reaction to a foreign body is set up, leading to spasm. Such a spasm can be seen when inserting a laryngoscope to be a closure of the whole glottis, including the ventricular bands and the aryepiglottic folds. The action of the abductor muscles, being the most powerful in their action, predominates and the larynx is closed. Sometimes the pads below the true cords swell while the patient is lying down. This swelling may start a spasm of the larynx.

Acute laryngitis, with spasm, is the most common laryngeal emergency. It is a very alarming condition, but fortunately not serious, as a rule. In cases that do not clear up promptly a laryngoscopic examination should be made to make certain of the diagnosis.

Occasionally it is necessary to intubate for acute laryngitis with spasm. I have seen but one such case. This child, eight years of age (case 7), was intubated in the middle of the night after a laryngoscopy revealed no edema and no membrane. The tube was left in place thirty-six hours and no further trouble developed.

"Acute streptococcic laryngitis" is the common name given the more virulent type of laryngitis. This is the condition the older books call "non-membranous croup" and others call "infectious laryngotracheitis," "flu laryngitis," "phlegmonous laryngitis." This type of laryngitis occurs in measles, scarlet fever, small-pox and chicken-pox.

This condition simulates diphtheria in that there is marked prostration, fever, chills, convulsions, croupy cough, and frequently acidosis, hoarseness, dyspnea and cyanosis. The diagnosis can easily and quickly be made by direct laryngoscopy. The laryngoscopic picture is a fiery red mucous membrane with hemorrhagic spots in places. The lining is velvety and causes the tracheal rings to become invisible. Edema of the orifice of the larynx may be present so that the cords, themselves, cannot be seen. There is no membrane and but little secretion.

Such a patient has his laryngeal obstruction to contend with plus his general toxemia. Both need treatment, but the obstruction, if severe, should be the first to be relieved. I have tried intubation in these cases, but have not always been satisfied with the results as I have had to do a tracheotomy quite frequently. Hence, I usually recommend immediate tracheotomy as the best procedure. Immediately preceding tracheotomy, I usually insert a bronchoscope to render breathing safe during the operation and, also, to help locate the trachea more easily. Mosher's "life saver" tube may be used instead of the bronchoscope.

This condition is frequently confused with whooping cough and with the laryngotracheitis of a vegetable foreign body. The X-ray usually will establish the diagnosis of a non-opaque foreign body.

Case 8.—A child referred by Dr. Siperstein had developed sudden laryngeal obstruction during the progress of a cold and sore throat. He had been immunized against diphtheria. Laryngoscopy showed no foreign body, but a red swollen larynx with a dirty grey exudate. Intubation was performed, with recovery in about one week.

Case 9.—A boy, aged 6, referred by Dr. Wilder, had had a sore throat and cold for twenty-four hours. During the night sudden dyspnea and dysphagia developed and he breathed noisily. At examination the child seemed very toxic, his temperature was 104 degrees, and his breath had an acetone odor. Laryngoscopy showed marked edema of the epiglottis, but the cords were not involved. Steam inhalations with some oxygen and cold packs were prescribed and the next day the larynx was better, but pleurisy developed and later empyema. Recovery eventually occurred.

Case 10.—A boy, aged 2, referred by Dr. E. D. Anderson, developed laryngeal obstruction during an attack of measles. Intubation was performed which gave him relief as long as the tube remained in place. He coughed out the tube on six different occasions, so a tracheotomy was performed, the bronchoscope being inserted as a preliminary safety measure. A partial subglottic stenosis developed, making it necessary to be extremely cautious in decanalizing. After tightly corking the tracheotomy tube for forty-eight hours it was removed, but after a few days it had to be replaced. The stenosis was dilated several times and finally decanalizing was accomplished. A year later there was still a wheeze present on forced respiration. The trachea was again dilated and following this the boy has seemed comfortable.

Membranous Laryngitis.—Vincent's angina, scleroma and non-diphtheritic membranous laryngitis are very rare in children. A membranous condition can be diagnosed by laryngoscopy. Antidiphtheritic antitoxin should be given even though the child has been immunized for diphtheria and checked up with a Schick test. Bacterial studies for positive diagnosis can be made later.

If the condition requires immediate relief, the membrane should be aspirated and, if suction will remove it, no further relief may be needed. Hospitalization of such a case is absolutely necessary. At the Minneapolis General Hospital, considerable success has been obtained with suction, cutting down the number of intubations and tracheotomies to a marked degree.

Numerous physicians in the United States have abandoned intubation in laryngeal diphtheria. They believe intubation tends to produce stenosis of the larynx, which tracheotomy does not. I believe intubation has saved many lives and should be given a trial. The operation should be quickly and gently performed with the proper sized tubes. If extubation is not successful in three or four days, tracheotomy should be performed and the intubation tube removed.

Paralysis of the vocal cords is not common in young children. Its presence at birth due to injury to the inferior laryngeal nerve is reported. The more common causes are diphtheria and poliomyelitis and in some cases no cause can be determined. Children with a suddenly paralyzed cord breathe with an exceedingly loud stridor. This noise is very suggestive of a paralysis of a vocal cord. A snap-shot diagnosis might be made when this characteristic noise is observed.

Case 11.—A baby four months of age, referred by Dr. L. F. Richdorf, suddenly developed very noisy breathing. He had some elevation of temperature but his color was quite good and there was little substernal retraction. There was no history of a foreign body and no membrane was seen in the throat. I had recently seen two infants with almost the same type of breathing due to paralysis of one vocal cord and made a tentative diagnosis of a similar condition in this case. Laryngoscopy confirmed this opinion. The next day X-ray showed a pneumonia of the superior lobe on the right which explained the paralysis of the right vocal cord. Recovery was complete.

This type of case tends to clear up in time and usually no emergency treatment is needed, but the symptoms are so alarming that laryngoscopy is indicated for diagnosis.

A case of spasm of the glottis at birth due to intracranial hemorrhage was reported by Monro,[5] but no laryngoscopic examination was made and intubation gave no relief. Bilateral spasm produces a complete but not permanent closure of the glottis. Bilateral paralysis is permanent but does not produce a complete closure of the glottis. Spasm due to inflammation has already been considered. Spasm due to foreign body or the passing of a laryngoscope will be considered later.

Laryngismus stridulus is a form of laryngeal stridor in children of sudden onset without temperature or previous laryngeal symptoms and no malaise nor prostration. It appears usually between the ages of four months and two years. There are twice as many boys affected as girls.

As a rule, laryngismus stridulus occurs in feeble children, those with tetany, rickets or malnutrition. The onset is sudden, usually at night. The lightest cases are characterized by simple sudden stoppage of breath, ending with a deep, long drawn out and often loud inspiration. This condition is sometimes called breath-holding.

In severe cases inspirations due to glottic narrowing are audible at the onset, become more marked as the stenosis increases, and finally end in a cessation of breathing. Pallor and cyanosis rapidly develop, sweating appears, and finally unconsciousness. Convulsions may occur. Death within a few seconds from suffocation or cardiac paralysis does occasionally, though rarely, take place. Otherwise the attack ends with an inspiration in which a high degree of laryngeal stenosis is still evident. Successive inspirations become easier and longer in reverse order to the onset of the attack.

This condition is considered by most authorities in pediatrics to be a spasm, but St. Clair Thompson's latest book and Jackson's latest book both state that laryngismus stridulus is not a spasm, but a collapse of the feeble tissues at the vestibule of the larynx. Thompson describes the attack as due to the child attempting to breathe through its obstructed nose until it becomes half asphyxiated and then, due to the air hunger, a sudden deep inspiration is taken. As the diaphragm descends with extra force and the glottis does not open, the soft parts are sucked together before the in-rushing air current. As further efforts to breathe are made, the blood becomes more venous until the carbon dioxide stimulates the respiratory center and the glottis opens, ending the attack.

Riese[6] believes the posticus muscles have a nerve supply from the sympathetic system. He refers to Onaidis' anatomical work and gives other reasons for this belief. Laryngismus stridulus, in his opinion, is due to a paresis of this sympathetic nervous supply and is not a spasm of the adductor muscles. He reports cases which have responded to the use of pituitary extract and believes this supports his view.

Jackson states, "The laryngoscopic appearance is typical. The mucosa is pale and distinctly non-inflammatory. At inspiration, the upper laryngeal margin is drawn in and the cords draw together and separate but slightly at expiration. Insertion of a bronchoscope stops the stridor and tracheotomy is not indicated."

Treatment of this condition during the attack would vary according to the accepted theory of its cause. During the interval between attacks the general condition, such as rickets, tetany, diseased tonsils and adenoids, gastrointestinal irregularity or parasites should be corrected.

If the attack is considered a spasm, antispasmodics are advised and the Germans recommend hedonal by rectum, which affects the breathing centers, powerfully reducing the overexcitability. Others use chloral, bromide, chloroform, etc.

If the attack is considered a collapse, respiratory stimulants should be used such as cold water dashed into the face, smelling salts to stimulate the nasal mucous membrane and the maneuver of pulling the tongue forward.

Case 12.—A child one year of age, referred by Dr. C. L. Rodgers, had a sudden laryngeal obstruction occurring about midnight, which did not clear up promptly. The larynx was examined at home by the direct method and laryngismus stridulus diagnosed. Intubation was required, which had to be repeated about twelve times during twelve days. Bronchoscopy was negative as was the chest X-ray. Insertion of the bronchoscope did not stop the attacks. A culture proved negative. On the thirteenth day the tube was again coughed up and this time breathing was quiet. Recovery resulted.

A foreign body lodged in the larynx is not common. In two hundred and fifty proven cases of foreign body in the air or food passages, I have had but eight in which the foreign body lodged in the larynx, and, of these, five were in children. Many patients with a foreign body in the bronchus have laryngeal symptoms caused by the passage of the foreign body, or by digital or instrumental trauma in attempts to remove it, or by trauma due to the foreign body bouncing in the trachea and hitting the glottis from below. Several of my patients had been given diphtheria antitoxin before the diagnosis of foreign body was made.

The presence of a foreign body should be considered as a possibility in all children whose laryngeal symptoms develop suddenly and do not disappear as is usual in croup or laryngismus stridulus. If the symptoms are so severe that some treatment is necessary, intubation by the indirect method would be unwise, as inserting the tube might result in more trouble. Inspection of the larynx will show the foreign body and its removal can be accomplished by the direct method. The resulting trauma can be appropriately treated if necessary.

Case 13.—I recently saw a child a year old, who was left in the care of her five year old sister. In the afternoon she was taken out of doors in the cold and during the night, about 2 a. m., she became "croupy." A doctor was called who prescribed steam and the baby was better the next day, but not well. Another doctor from the same clinic saw the baby and diagnosed bronchitis. A day or so later a third doctor saw the child and diagnosed asthma. An X-ray of the chest was taken and, at the top of the film, a safety pin was seen in the larynx.

Case 14.—A baby one year old was referred by Dr. Schultz with symptoms of laryngeal diphtheria for which treatment was carried out ten days. X-ray revealed a safety pin in the baby's larynx.

A papilloma is the tumor commonly found in the larynx of an infant. This may cause all the symptoms of severe laryngeal obstruction. After the diagnosis is made, if emergency exists, a tracheotomy is indicated as the tumors have to be removed later and this cannot be done safely with intubation.

Tracheotomy alone may cure some cases of papilloma.

Case 15.—A patient of Dr. E. H. Parker's had a tracheotomy at the age of two with no further treatment. The tube was worn for fifteen years with but one or two changes. Her voice became normal and respiration was normal with the tube corked, but the mother would not consent to its removal. Finally it was removed and a plastic operation done to close the fistula, which was successful. The larynx is perfectly normal.

Epulation may cure others. In one case treatment was started at the age of two and one-half years. There had been hoarseness since birth, cough and attacks of cyanosis on exertion. Eleven operations were performed over a period of two years, resulting in a clear voice but low in pitch. There has been no recurrence in the past six years.

Fulguration seems to help others. Radium is of value but tends to produce necrosis of the laryngeal cartilages and may lead to abscess of the larynx or an esophagotracheal fistula.

Cure in some instances does not seem possible. A patient thirty-three years of age, referred by Dr. Nathanson, wore a tracheotomy tube thirty-one years. The larynx is still full of papillomata. Operations at ranging intervals have been necessary all her life.

Other types of tumors such as cysts and angiomata occur rarely and the treatment varies according to the condition present.

Conclusion.—Direct laryngoscopy has made possible the accurate diagnosis of laryngeal conditions in infants. The older ideas have been clarified and treatment made more logical.

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SPONTANEOUS PNEUMOTHORAX*

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OUR purpose is not to report a large number of unusual cases, not to advance any new theory as to its cause, nor to recommend any new procedure for its treatment. It is merely to present a condition which does occur frequently enough so that we should all see a few cases, and a condition which is easy to diagnose, if we will just keep it in mind.

Spontaneous pneumothorax means the accumulation of air in the pleural cavity from any internal cause. Tuberculosis is considered the cause in eighty to ninety per cent of the cases by most writers, the perforation of the visceral pleura resulting from the rupture of a subpleural tuberculous focus into the pleural cavity. The remaining ten to twenty per cent are the result of a variety of causes, some of which are—the rupture of an emphysematous bleb, the tearing of an adhesion during violent exercise, or a paroxysm of cough; or any pulmonary disease, as abscess, gangrene, infarction or emphysema, which can cause an erosion or rupture of the visceral pleura. Also, an esophageal growth may result in an ulceration through the mediastinal pleura, or a perforation may be caused in this location by a sharp pointed foreign body in the esophagus. Then there are a few cases for which no cause can be found. These are called idiopathic spontaneous pneumothorax. These patients usually recover promptly and no sequelæ follow. Most likely these so-called idiopathic cases are due to the rupture of small blebs, or the rupture of small superficial tubercles.

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A spontaneous pneumothorax may be partial or complete, and may remain simply an air filled cavity, or it may become associated with a serous, purulent, or hemorrhagic effusion. The effusions generally indicate the presence of some active pulmonary disease.

A pneumothorax is said to be open when the pleural sac communicates freely with the external air, either through a wound in the chest wall, or through a bronchus; closed when the opening becomes sealed and the accumulated air is gradually absorbed; or valvular when the opening permits air to enter during inspiration, but closes during expiration with the result that air accumulates under increasing pressure. This latter condition is spoken of as tension pneumothorax.

Our cases, which will be reported later, are eight in number, and have come to us during a period of five years. The fact that only two of these were associated with definite tuberculosis leads us to believe that in a general practice tuberculosis may be a lesser factor in the etiology of spontaneous pneumothorax than has been taught. And, quite naturally, the statistics garnered from hospitals and sanatoria would deal with abnormal percentages of tuberculous individuals.

The onset of a spontaneous pneumothorax is usually sudden, and characterized by a sharp pain on the affected side, which may extend up and out into the arms, and may extend down into the abdomen. This is followed by marked dyspnea, cyanosis, and the general symptoms of shock. If the collapse is the result of a preexisting tuberculosis, or other inflammatory disease, the onset may be insidious and the patient may not know when it happened. This is due to the presence of adhesions which prevent the lung from collapsing suddenly or completely.

On examination, the following signs are found: There is little or no motion with respiration on the affected side, and the intercostal spaces are obliterated. The heart is displaced away from the affected side. The liver may be greatly depressed when the right side in involved. The breath sounds and voice sounds are suppressed, or entirely absent. Tactile fremitus is absent or greatly diminished. About this time one begins to suspect a pleural effusion, but on percussion, instead of feeling and hearing a dull flat thud, one is surprised to hear a highly tympanitic note. If fluid is also present, there is a corresponding area of dullness in the base, which comes up to a definite horizontal level and changes with a change in position.

The roentgen examination, made by either fluoroscope or film, and better by both, confirms the diagnosis.

The duration of the disease depends on the underlying condition, and on the presence or absence of infection. The case without apparent cause, the idiopathic spontaneous pneumothorax, which is believed to be the result of a rupture of a small sub-pleural tubercle or emphysematous bleb, or the tearing of a small adhesion, usually clears up in from two weeks to two months. The duration, however, may be indefinite, and at least one case has been reported that was permanent. The prognosis in active tuberculous cases is naturally more serious, and in these cases it has the same significance as hemoptysis.

The treatment is a simple matter in most cases. Morphine may be required for the pain at onset, and shock, if present, is treated in the usual way. As it is necessary for the fistula to close before the lung can expand, the patient should be kept in bed and quiet. Cough should be controlled and deep inspirations should be avoided. The latter tend to aspirate more air or infectious material into the pleural cavity. To this end, the affected side should be strapped.

In valvular cases, when the air accumulates under increasing pressure, and dyspnea and cyanosis become increasingly severe, it is necessary to aspirate just enough to relieve the symptoms.

Bilateral involvement does occur and is rapidly fatal unless some of the air can be aspirated.

When fluid develops, aspirations should be delayed until the fistula has had time to close, unless it is producing pressure symptoms.

Case 1.—R. B. B., a bookkeeper, aged 59, was operated upon in February, 1921, for a ruptured duodenal ulcer. One month later he had to be operated upon again for the same trouble. In May, 1925, while walking down the street, he was taken with a sudden severe pain across the upper abdomen. The abdomen was rigid and, quite naturally, it was suspected that another duodenal ulcer had ruptured. His white count, however, was only 12,600. The following day it was lower and his general condition was better. Because of some confusing signs in his lungs he was taken to the fluoroscope, where a right pneumothorax was discovered. Recovery was uneventful. In 1928 he was brought into the hospital with an acute appendicitis. Before operation his lungs were fluoroscoped and appeared normal. The appendix was gangrenous and he died.

Case 2.—S. D. F., a farmer, aged 48, was referred to the clinic supposedly suffering from an acute cholecystitis. Thirty-six hours previously he was awakened at 4 a. m. by a feeling of great distress and oppression in the right chest. He could not take a full breath. Later he had pains across the lower chest, which radiated around both sides to the back. There was some waterbrash, but he ate well and felt better after eating. On examination the left chest was found immobile and the intercostal spaces obliterated. Breath sounds were distant and percussion hyperresonant.

The diagnosis of left spontaneous pneumothorax was confirmed by X-ray.

In going into the past history of this patient, it was learned that he had had a cough with occasional blood streaked sputum for the past three years, also frequent night sweats, which made one suspect tuberculosis as the likely cause, although the X-ray showed no active lesion, and no tubercle bacilli were found in five sputum examinations. A recent report from this man said that he was working steadily and the cough was about the same as before.

This case was especially interesting for two reasons: the attack came on while he was asleep and the pain was mostly on the right side and the pneumothorax was found on the left.

Case 3.—G. R., a male, clerk, twenty-five years of age, was working at his desk when seized by a sudden severe pain over the heart, referred into the left shoulder and arm and down into the left abdomen. It brought out a cold sweat and he felt nauseated. He was brought in and seen at the Clinic twenty minutes later. Lips and nails were cyanotic, and heart tones at the apex were barely audible. The left rectus muscle was boardlike. He was sent to the hospital as a coronary occlusion, which would have been an unusual accident in a person of his age. His temperature was 99, w.b.c. 11,300 and electrocardiogram normal. The latter was accepted with the tentative diagnosis because the characteristic changes in coronary occlusion are often not seen until the next day. The following morning the left chest was splinted, breath sounds distant, fremitus diminished and percussion note hyperresonant.

Diagnosis: Left pneumothorax, confirmed by X-ray.

X-ray after two weeks in bed showed only a small amount of air at the left apex.

X-ray after one month showed complete absorption. X-ray after four months, negative for tuberculosis, and he has been well since.

Case 4.—M. F. M., a farmer, aged 22, had had a sudden sharp pain in the left chest five days previously, while stooping over. He was in bed one day, and unable to work since the onset because of pain and inability to take a deep breath. On examination, the heart was found displaced to the right and the tones indistinct. The percussion note on the left was hyperresonant.

The X-ray showed a left pneumothorax, and healed tuberculosis in the right apex. He could not go into the hospital so was told to stay in bed one month at home and keep a temperature record. After one month he returned. He said he had been in bed just one day, but that he had done nothing requiring exertion.

The lungs were completely re-expanded, he had gained two and one-half pounds and there were no signs of active tuberculosis.

Case 5.—S. U., female, aged 38, a teacher, was sitting quietly in a chair after a leisurely walk when she was seized with a sudden sharp pain in the right chest. She came to the Clinic the next day. Breath sounds were distant and percussion hyperresonant over the right chest. No tactile or vocal fremitus were present, and the heart was displaced to the left.

X-ray showed a right pneumothorax. There was complete absorption of air after two weeks in bed.

X-ray three months later and again two years later showed no tuberculosis.

Case 6.—K. McK., a female, aged 27, a stenographer, had had an incipient tuberculosis in 1926 involving both apices. By March, 1930, the tuberculosis was thought to have been completely arrested. On jumping out of bed to close the window, she was taken with a quick sharp pain in the right chest. On examination the right chest was found immobile, the breath sounds distant, and percussion note hyperresonant.

X-ray showed a right pneumothorax and she was kept in bed three months.

X-ray taken one year later, in May, 1931, showed healed lesions in both apices.

Case 7.—R. D., a male, aged 16, student, seemed perfectly well, had a good appetite, was active and gaining weight until September 28, 1930, when he had a severe coughing spell, so severe that it left him faint and trembling. The next day he had another, but not quite so severe. On the third day he was awakened at 2 a. m. with a cough, followed by hemoptysis of about one-half pint of blood. Examination one-half hour later, hemorrhage had stopped, pulse 140, temperature 102. Over left chest there was no expansion, no breath sounds and percussion was tympanitic. The heart was markedly displaced to the right. Diagnosis was pulmonary tuberculosis, pulmonary hemorrhage and left spontaneous pneumothorax. He was kept flat on his back. The air began to be absorbed very rapidly and one week later he was moved to the hospital, where we intended to continue the pneumothorax artificially.

The X-ray showed lung completely re-expanded and a diffuse tuberculous infection throughout both lungs. He died two months later.

This case is unusual in that an advanced tuberculosis was ushered in by a pulmonary hemorrhage and a spontaneous pneumothorax, the latter most probably stopping the hemorrhage. There was no pleural effusion and no sign of any blood having escaped into the pleural cavity. The air was completely absorbed and the heart back to normal position at the end of one week.

Case 8.—P. B., a male, aged 21, bookkeeper, was taken with a sudden pain in the upper left chest and arm, after walking across the office floor. Breathing became short and fast and he could hardly talk. On examination, lips and finger nails were cyanotic, excursion of left chest was restricted, breath sounds were distant and percussion hyperresonant. The heart was displaced to the right.

An X-ray of the chest showed a left pneumothorax. He had had four similar previous attacks.

In 1928 he "flopped" a pole vault. The attack came on that evening.

January, 1929, he jumped over a snowbank and attack came on one hour later.

August, 1929, attack came on while walking down town and he had to be carried home.

November, 1929, attack came on while shaving and he had to be carried in to bed.

He saw no doctor after these first spells, although he says they were more severe than the last one. He stayed in bed one or two days, after which he noticed no dyspnea, but had to be careful about lifting or straining for a few days. This time he was kept in bed for two weeks, after which re-expansion of the lung was complete.

X-ray one year later showed normal lungs.

This case is interesting, not only because of the recurrences, but also because it illustrates the fact that an attack can come on several hours after the exciting cause.

While these case reports are not complete histories, they do contain the salient points. They show some of the conditions which can be confusing in the diagnosis, namely, cholecystitis, coronary occlusion, ruptured duodenal ulcer and pleurisy. They also show how comparatively simple the diagnosis is when this possibility is borne in mind.

The teaching that tuberculosis is the most common cause must certainly be respected, and an individual should not be dismissed upon recovery from the pneumothorax, but should be systematically followed for many months for further evidence of tuberculosis.

HEART DISEASE IN CHILDREN*

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The increasing force with which our attention has been called to the rising importance of heart disease as a cause of death makes it seem well that we occasionally take inventory of our knowledge of the subject, that we miss no opportunity to halt the progress of this greatest contributor to mortality in man. In the years 1917 to 1925[1] the population of the country increased over 10 per cent, the deaths from heart disease doubled, and the deaths to which heart disease contributed increased 81 per cent. Comparative figures of accuracy are difficult to obtain but when it is realized that more than 25 per cent of this great mortality[4] is due to forms of heart disease originating in childhood it brings to us the importance of attacking this problem where first seen, and, more important, of instituting prophylactic measures.

While the great mortality from heart disease is in adult life, about 20 children per 100,000 from 5 to 19 years of age in the United States Registration area (comprising 37 states and 82 per cent of the population) die yearly of heart disease, which ranks third among the causes of death in this group. The lack of the dramatic element in this disease and the insidious nature of its onset and progress have tended to prevent the attention being paid to the problem which it deserves. However, through the activity of the American Heart Association and the formation of local organizations to increase interest in the work, there has been in the past few years an awakening to the fact that this problem must be met with the intelligence we have been giving to that of tuberculosis, a problem similar in many aspects.

GENERAL CONSIDERATIONS IN CHILDHOOD

There are certain general considerations regarding the heart in children which are well to bear in mind. The heart itself is relatively large normally. The apex beat up to the age of seven years is located in the fourth left intercostal space, so that its presence in the fifth space before this time is evidence of hypertrophy. Enlargement of the heart in children causes an early precordial bulging of the chest wall which so accommodates itself to pressure. Normal sinus arrhythmias are frequent, sometimes so marked as to make them difficult to tell from pathologic rhythms. Extrasystoles are infrequent in children in the first decade,[5] and when found are usually due to a toxic myocardium, or organic heart disease.

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Bradycardias may be normal or may represent such toxic myocardial effects as those of jaundice and diphtheria toxin, the effects of intra-cranial disease, or varying grades of heart block. The heart sounds in the first year are of the tick-tock type, not to be confused with the ominous import of such a sound in the failing adult heart. Murmurs of functional type are frequent, usually basal, soft and blowing in quality, but sometimes hard to differentiate from true pathologic murmurs.

CLASSIFICATION

Heart disease in childhood is rather simply classified as congenital and acquired. About 10 per cent fall into the group of congenital disease, or, as they usually actually are, congenital heart defects, which will be considered briefly.

CONGENITAL HEART DISEASE

Etiologically,[2] congenital heart disease may occur from : (1) abnormal development (patent interventricular septa, etc.); (2) fetal endocarditis (resulting in congenital stenosis, usually pulmonary); and (3) failure of normal prenatal orifices to close (as patent ductus arteriosus and foramen ovale). The examples mentioned comprise the great majority of conditions encountered, others being decidedly infrequent and seldom diagnosed. These are often combined with each other, the signs due to two or more lesions making diagnosis especially difficult, although the more important lesion usually is emphasized by its own signs and can be so identified.[3]

Patent foramen ovale, the most frequent, is clinically unimportant because it is rarely large enough to embarrass the heart unless associated with other more serious lesions. Patent interventricular septa are next in frequency, do not usually produce cyanosis and are characterized by a substernal thrill, loud rough murmur heard best to the left of the sternum and transmitted over the precordium and to the back, an accentuated pulmonic second sound, and a globular heart by X-ray. A good many of these patients have other associated congenital lesions. They often live to adult life but usually die early from endocarditis or decompensation.

Pulmonary stenosis, uncomplicated, is usually fatal during the first year, but when associated with patent interventricular septum, which helps to compensate for the pulmonary lesion, adult life may be reached. The average age at death is nine to twelve years and those which reach adult life tend to develop decompensation easily. They are characterized by cyanosis, clubbed fingers, systolic thrill over the second and third inter space to the left of the sternum, enlargement of the heart, especially to the right, a loud harsh basal systolic murmur, transmitted over the entire heart, and a weak or absent pulmonary second sound.

Patent ductus arteriosus is not often found alone, but when so occurring the prognosis is usually good. More often does it compensate for septal and pulmonary valve defects. It is characterized by a rough systolic thrill over the base of the heart and a loud rough murmur rising with systole, passing over into diastole and then diminishing, heard above the heart. The second pulmonic sound is accentuated.

The foregoing characteristics make it often possible to diagnose a lesion but often the combinations create great difficulties and only the fact that a defect exists can be recognized. There is little in the way of treatment available. The cyanotic child should be protected from exertion, should have plenty of rest, good hygiene, and effort should be made to avoid infection. It is well to prepare educationally for a sedentary type of occupation. There is little indicated medically but nitroglycerine is occasionally of value in the attacks of cyanosis to which many are subject.

ACQUIRED HEART DISEASE

With a few exceptions, the story of acquired heart disease in children is essentially that of rheumatic fever. Diphtheria toxin produces a severe toxic myocardial insufficiency, not infrequently fatal. The contrast between the severe degree of injury shown by the heart muscle and the fairly complete and permanent restitution of cardiac efficiency is most striking. This condition is preventable and practically never seen where sufficient antitoxin is given within the first thirty-six hours.

The cardiac sequelæ of scarlet fever have so many similarities to rheumatic heart disease that it is not unlikely that they have the same pathogenesis. Pathologically they are very much alike and occur in similar age periods with rheumatic disease.

The ulcerative endocarditis of various types of septicemias must be mentioned among the acquired types. Practically it is unimportant because it is a late manifestation of conditions which are nearly always fatal, and no known treatment affects its course, which is characterized by variable murmurs of endocardial origin and embolic phenomena. Subacute bacterial endocarditis, infrequently observed, has been thought by some to be etiologically identical to rheumatic carditis, and is probably not so invariably fatal as originally considered.

RHEUMATIC FEVER

It is, however, with the consideration of rheumatic fever that the most important field of cardiac disease in children is entered. Nearly 90 per cent of cardiac diseases is rheumatic in origin. Of these patients a considerable proportion die in childhood, and the rest constitute the bulk of adult heart disease up to the age of forty, a large proportion being crippled or killed within this period. To know rheumatic heart disease one must know rheumatic fever, because the heart condition is only one of the protean manifestations of this disease, characterized as it is by exudative and proliferative lesions of the serous membranes, sinuses, tonsils, joints, nervous system and heart. It is therefore just a phase of a disease which is seen in many forms. It is the most important phase because it is the most crippling, and occurs most frequently, it being definitely demonstrable that the heart is involved in 90 to 100 per cent of all cases of rheumatic fever.[6]

Since the onset of rheumatic heart disease, or carditis, is usually insidious, a knowledge of the other manifestations of rheumatic fever and tendency to remissions[20] will point out earlier the presence of this disease. This should lead to the important periodic observation for cardiac signs and especially for the signs of activity of the infection, and permit the institution of intelligent management.

These signs may be summarized as follows:

1. Polyarthritis: the well known migrating type of acute arthritis, affecting usually the larger joints, with extreme tenderness and good response to the coal tar derivatives. This is often the first manifestation, usually occurring before the age of ten.

2. Joint and growing pains: fleeting pains in various joints, or in the muscles, chiefly of the thigh or calf of the legs, or in the hamstrings just behind the knees.[8,9] They may be intermittent or persistent, and are not infrequently the earliest and only manifestations preceding cardiac involvement.

3. Tonsilitis: occurring in about 50 per cent of the cases and present as a first manifestation in 14.3 per cent of a series of 500 cases.[7]

4. Chorea: occurring in 42.8 per cent of the aforementioned series.

5. Rheumatic nodules: small rice-like bodies under the skin, especially over the bony prominences and joints. They are associated with other very severe manifestations, and occur in about 15 per cent of cases, which as a group show a high mortality.[7]

6. Upper respiratory infections and acute nephritis[10] may be included as manifestations.

These various manifestations, including the carditis, rarely occur under three years of age, usually from six to ten years, and have a marked tendency to recrudescence. The younger the patient the more the tendency, although a marked increase in the recurrences is found at puberty. The later the disease manifests itself the more likely that the recurrences will be widely separated and the development of heart signs will appear later.

OCCURRENCE

Contrary to what has frequently been supposed, the majority of children with rheumatic carditis come from moderately well-to-do homes. They do not live in an environment of dampness, and are not overcrowded in their habitations. They live chiefly in temperate climates, and only a very small proportion are from other than the white race (4.6 per cent in 500 cases).[7]

It is interesting to note that a series of studies of familial infection shows that in 29 per cent,[11] 36 per cent[12] and 50 per cent[13] of the families having rheumatic cardiac children, two or more children were found to have this disease. Also while about 10 per cent of those with rheumatic cardiac disease give no history of other manifestations of rheumatic fever, a high incidence of these symptoms can be found in the histories of the unaffected members of the family. Recognizing the marked similarity of many aspects of tuberculosis to those of rheumatic fever it is significant to point to a study by St. Lawrence, who in comparing the cases of each disease discovered in affected families found that 14.8 per cent of exposed individuals in rheumatic families were attacked by rheumatic fever and 14.6 per cent of those in tuberculous families were affected by some form of clinical tuberculosis. In view of the stress laid upon the importance of control of contacts in tuberculosis it is of more than passing interest to consider these observations.

ETIOLOGY

As to etiology it must be admitted that while no specific agent has yet been incriminated, the streptococcus is generally considered to be the cause. Numerous workers have isolated such an organism with varying success from blood and tissue cultures taken from rheumatic patients. Clawson[24] has been successful in 50 per cent of his cases, and also feels that there is much evidence pointing to the same etiology existing here as in subacute bacterial endocarditis, where the streptococcus is so regularly found.

CLINICAL FORMS

Rheumatic carditis occurs as a myocarditis, endocarditis, or pericarditis, often associated, but probably occurring in frequency in the order named. Repeated work has shown that the heart muscle is affected in practically all cases of rheumatic fever as demonstrated by electrocardiographic studies. Seham[14] has shown that after six months of age the normal mechanism is the same as in the adult, and that the child is subject to the same abnormalities. Among the changes found are an almost constant increase in the conduction time (P-R interval) which is unaffected by antirheumatic drugs, bundle branch and arborization changes, a great variety of changes in the S-T interval as lengthening of the S wave upward and convexity or concavity of the S-T interval, and changes in the T wave. Where any doubt exists as to myocardial involvement, the electrocardiogram is of great value. With the subsidence of the attack the myocardial phase usually recedes, but occasionally there may remain a myocarditis as demonstrated by precordial discomfort, persistent fever, persistent leukocytosis, anemia, anorexia, enlarged heart, relative valvular insufficiency or tachycardia.

Endocarditis, or rheumatic valvulitis as it is better called from its now recognized pathology, is not easily detected in its incipient stages where its physical signs are due to the valve deformity occasioned by swelling, and a variable murmur, systolic or presystolic, may be the only finding. Usually the mitral valve, less often the aortic, and infrequently the others are involved, and it is the cicatricial changes associated with the healing process occurring here and producing the typical clinical features of valve deformity, which may seriously embarrass the heart long after the active inflammatory process has subsided. These changes proceed at variable speeds, apparently depending on the extent of the valvulitis, and this accounts for the marked delay in appearance of the typical picture which embraces so large a portion of the cardiopaths in early adult life. The marked tendency to recurrence of rheumatic infection is seen here also and the multiple valve involvement is probably always due to multiple infection, the later ones of which are practically always the causes of decompensation when seen in children.

The typical valve lesion produced is stenosis of the mitral valve as the scarring progresses, it being relatively infrequent, as Cabot[15] has shown, to find an uncomplicated mitral insufficiency. The earliest signs are the loud sharp apical first tone, and the accentuated, reduplicated pulmonic second tone, with a soft transmitted apical systolic murmur. Later the typical presystolic or mid-diastolic murmur appears, associated with the characteristic outline as shown by the X-ray. The aortic valve usually develops an insufficiency as the lesion progresses, with its to and fro blowing basal systolic and diastolic murmurs (heard best as a rule over the second right interspace, less often under the sternum or as low as the fourth left space), the high pulse pressure, water hammer pulse, capillary pulsations, and Duroziez' sign. Aortic stenosis is more difficult to recognize and occurs much more often than it is diagnosed, the characteristic basal thrill, loud rough basal systolic murmur, and plateau pulse being infrequently combined as a clinical picture.

Pericarditis is less frequently seen. Before the age of five it is seldom rheumatic, being usually secondary to one of the acute exanthemata, typhoid, erysipelas, or other infection. After five years it is usually rheumatic, often associated with a severe pancarditis. It may be fibrinous, serous, or suppurative in type, associated with or without a palpable or audible friction rub at the base, and is often missed in diagnosis as it is overshadowed by other features of the disease. The rapidly widening percussion area, atelectasis of the base of the left lung, distant rapid heart sounds, marked substernal pain and orthopnea, as well as the friction rub which is pathognomonic, indicate the diagnosis. Chronic adhesive pericarditis may occur in children, and when advanced enough to produce signs of heart failure, is serious. The electrocardiogram is helpful in diagnosis, and cardiolysis may be of help in treatment.

SIGNS OF ACTIVITY

Recognizing the early appearance of heart involvement in rheumatic fever, and the tendency for the infection to persist in a low grade form for a long time, it is necessary to look for signs of activity of the infection, especially in the heart, that proper treatment may be pursued. Since these signs will be discussed later under the matter of treatment, they will not be further dealt with here except to state that their recognition as such may lead to the consideration of rheumatic fever in children where chronic infections of uncertain diagnosis have persisted.

IRREGULARITIES

Irregularities of the heart are infrequent in children, but any of those found in adults may also occur here. The practical absence of extrasystoles in the normal child[5] makes such an ordinary arrhythmia of adult life a more significant occurrence in childhood. The normal sinus arythmia is often so marked and difficult to interpret clinically that only the electrocardiogram will distinguish it from a rhythm with many extrasystoles or auricular fibrillation or flutter. The latter two are infrequent and nearly always associated with advanced and grave heart disease. Paroxysmal tachycardia, paroxysmal flutter, or paroxysmal auricular fibrillation are uncommon, the first occurring occasionally in later childhood, and the latter two being almost always a part of degenerative heart disease, which is seldom seen in early life.

TREATMENT

If the many similar aspects of tuberculosis and rheumatic fever would lead to a greater similarity in the general plan of treatment of these patients, there would undoubtedly be much less chronic heart disease left after the infection has been eliminated. There is no question but that a large number of these patients are permitted to resume activity before the infection has entirely subsided, and the failure of development of an adequate defense against the infection increases the tendency to recrudescences which are so characteristic of the condition. The disease must be treated as a chronic one, and Swift has found much better results in his series where the patients are kept in bed from two to three months or longer according to the persistence of signs of activity.

The common and alleviating use of salicylates and allied drugs in the acute stages of rheumatic fever makes the patients so comfortable that it serves to mask the presence of certain indications. It is apparently most useful in combating the exudative phenomena of the disease, as it is of no demonstrable value in chorea or carditis where the lesions are mainly proliferative.

The absence of any specific therapeutic agent for rheumatic fever makes it obvious that the treatment must be general and symptomatic. Good nursing care is essential and it is unnecessary to go into details which are common to all textbooks, to extol the virtues of rest, environment, nutrition, heliotherapy and others. The frequency of multiple infections in a family makes it seem wise that a careful technic of handling the patient, and advice to those exposed regarding the possibilities of danger, be stressed in management. The patient with active infection should be kept in bed until all signs of activity have subsided, even though this may mean many months. These signs are important to know and may be outlined as follows:

1. Fever. This is always to be considered a sign of activity, although other signs may be present without it. Since it is usually highest in those cases with exudative phenomena, it is nat-

urally most marked in those in which the coal tar derivatives are most comforting and efficient in alleviating the condition, best exemplified by the polyarthritis. The temperature falls often to normal under such therapy and it is a not uncommon mistake to permit a patient to resume activity while still under these drugs which are masking the picture of activity of infection from the symptomatic and febrile point of view. Therefore no patient should be considered afebrile until the temperature remains normal after the patient is free from the influence of such drugs. In certain instances the temperature will show an occasional rise at intervals of several days and this should not be ignored. At least ten days of normal temperature should be shown before considering the infection inactive from this angle.

2. Pains: Muscle, joint, and precordial pains are often an indication of activity, and should be so considered until proved otherwise. As in fever, the masking effect of the antirheumatic drugs is marked, and it is better to have had the patient off these drugs about two weeks, before these signs can be considered as gone.

3. Leukocytosis: Repeated leukocyte counts give valuable information as to activity. With subsidence of the infection, the counts gradually come down to normal, the curve of reduction following the curve of fever decline in a somewhat delayed manner. Any delay in the approach of leukocyte count to normal must be considered a sign of activity.

4. Anemia: Anemia being fairly constantly associated with activity should be carefully considered. As the infection subsides this should improve, although not infrequently the anemias which are associated with mitral stenosis are found to be most resistant to therapy, even in the absence of other signs of activity. Thus great caution should be exercised in regarding an infection as inactive where the anemia proves resistant to treatment.

5. Pulse response: The pulse rate should have returned to normal with subsidence of infection and a normal type of rhythm be present. The response to the usual exercise test will give valuable help in determining the heart's efficiency,[7] the return to a previous rate requiring more than three minutes being considered abnormal.

6. The child should show a normal gain in weight.

7. Signs of fatigability, lack of appetite, afternoon irritability, and restless or delayed sleep are often signs of activity and should be relieved before the infection can be considered inactive.

8. Signs of heart failure in children, as basal lung râles, congestion of the liver, dependent edema, cyanosis, etc., are practically always caused by an active rheumatic carditis.

After the activity has subsided a prescribed course of gradually increasing exercise should be worked out as well as possible. The child will usually show if it is being pushed too fast by the poor heart response to exercise and by the tendency to avoid exertion which distresses it and certain types of playing with other children which lead to undue fatigue. As convalescence proceeds the child will usually be able to pursue a normal course of living, with full myocardial compensation. Breaks in compensation, as stated, are nearly always due to lighting up of the infection,[19] and in such an event the treatment must be repeated.

In the acute stage drugs are never indicated except for symptomatic relief. Sodium salicylate still remains the most reliable of the safer products to control the joint symptoms. Where the carditis is the only manifestation the patient is often restless and as complete relaxation as possible should be secured. For this distress Tr. Opii, two to four drops every three hours in older children, is often very helpful. Digitalis[17] is contraindicated in the acute stages, probably acting as a toxin to the heart muscle. Serious accidents may occur from its use.

In that very small group of decompensated patients without active infection, the heart is always enormously enlarged as the result of repeated infections and the therapy is the same as that used in adults. Here digitalis is indicated but the patients are very refractory to treatment and the prognosis is decidedly bad as to life expectancy.

Since most of these children are of school age, the routine of their education imposes certain burdens which should be considered.[18] Their instructors should be acquainted with the problem. It is wiser that these children should be permitted to enter and leave school outside of the regular hours, and be excused from such exertions as gymnasium and fire drill. Many of them under close supervision can partake in athletics, but the competitive variety should be forbidden. Most of them require no special solicitude, but for those who do, it may prevent the lighting up of the infection which undue fatigue can precipitate. Adequate rest is just as essential as in tuberculosis.

The question of tonsillectomy has been very carefully studied.[1,21,22] There is little question that tonsillitis may be one of the manifestations of rheumatic fever, and as the tonsils are not the sole focus of the disease, their removal would not be expected to cure it. Nevertheless a tendency to frequent upper respiratory infections which is often eliminated by the removal of diseased tonsils may so reduce the resistance of the patients that the rheumatic fever lights up. Kaiser,[21] in an analysis of 48,000 school children, observed that the tonsillectomized child without previous rheumatic fever has a much better chance to escape the disease than the one with tonsils, and that scarlet fever, heart disease, and recurrent attacks of rheumatic fever are less common where the tonsils have been removed.

PROPHYLAXIS

While the prevention of rheumatic heart disease, a goal sought by the profession, is somewhat discouraging in the absence of control of the etiologic agent, there are certain observations which may be suggested as helping to aid this end:

1. Periodic examination of children. To this the parents must be educated, and emphasis must be laid on the importance of the pre-school age, before the child is seen by the school physician. The family physician is in the best position to guide such activity.
2. Removal of foci of infection in teeth, tonsils and sinuses. While authorities disagree on the problem of teeth removal in children, all are agreed that roentgenologically demonstrated root infection is adequate reason for such action. The intelligent coöperation of the dentist is necessary here. Demonstrable infection in the tonsils or sinuses indicates its removal, and the history of repeated attacks of tonsillitis reads its own verdict for tonsillectomy.
3. Adequate rest after infections. Detention in bed for several days after any acute infection and repeated later examinations will give assurance that the physical condition of the child is satisfactory before resuming activity.
4. Heliotherapy over long periods seems to definitely increase the resistance to infections. Significant may be the fact that the highest incidence of rheumatic fever occurs at the end of the winter months, and in the temperate climes.
5. The maintenance of satisfactory nutrition is of great importance in building up resistance to infection.

PROGNOSIS

Considering our experience with patients suffering from rheumatic carditis, about 75 per cent of them will be restored to a normal functional capacity on recovery. The rest represents patients with varying grades of compensation. The majority will be found to be held back by the presence of extra-cardiac foci of infections, occasionally by overweight conditions and toxic states as hyperthyroidism. The correction of these is usually sufficient to bring back compensation with fair reserve. Four to 5 per cent of the patients have low grade persisting rheumatic fever, must be kept in bed, and the outlook is decidedly bad. One to two per cent will be afebrile decompensated children who have had repeated rheumatic infections, who have failed to develop resistance to the infection, and in whom the outlook is unqualifiedly bad. Of rheumatic children up to the age of fifteen years, about 10 per cent will die in that period, usually of rheumatic heart disease. There are no known reliable figures on the outlook for the 75 per cent who recover functionally. However it is known that while many escape further infection and have not developed a sufficient or progressive enough degree of damage to later embarrass them, a great many others develop recurrences later, or show the effects of slow cicatrization of valve defects, and eventually prove the most substantial contributors to the group of heart patients below the age of forty. It is in this group that we hope to materially improve the prognosis through the control of rheumatic fever in children.

SUMMARY

The problem of heart disease in children opens up for us a means of attempting to alleviate much suffering, not only in children, but in early adult life.

Congenital heart defects cannot practically be prevented, and when seen are simply problems of management of activity and protection against infection.

Rheumatic heart disease is deserving of much study. It is felt that much of the crippling type of this disease may be prevented by adequate care while the infection is active, and it is urged that an attempt be made to so guide every patient through this stage and the later period of tendency to recrudescence so that further damage may be avoided.

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THE TREATMENT OF RICKETS*

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RICKETS offers a striking example of a comparatively large number of diseases that have undergone a marked modification during the last two decades. The cases of rickets encountered fifteen or twenty years ago were more florid than those seen today. Now the disease is usually of so mild a type that it is far more frequently overlooked than diagnosed and consequently a large number of cases are untreated.

It is not the purpose of this paper to discuss the diagnosis of rickets or to remind you of its almost universal presence when prophylactic measures are disregarded. Rather it is hoped to emphasize the necessity of treatment by recalling its frequency and again drawing your attention to its relationship to upper respiratory tract infections, its effect on the prognosis of such diseases as pneumonia and its remote influence on functional and organic disturbances of later life. The present treatment has been largely developed during the last decade.

No attempt will be made to discuss the treatment of rickets from a public health standpoint. As an economic problem it is of greatest interest to those dwelling in large cities. The disease, however, does exist in smaller communities and in the country, but to a far lesser extent. In some of the small cities in the territory encompassed by this society, industry is seemingly unable to solve the basic problem of continuous employment at an adequate wage. Consequently increasing demands will be made upon the medical profession for time, knowledge and even money to meet community health problems. Rickets is not the least of these problems. The fact that some localities are now treating rickets from a communal standpoint may have some significance for us.

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PRENATAL CARE

In considering preventive measures from an individual standpoint, prenatal care has failed to offer the benefits expected. While a certain predisposition or susceptibility to rickets is recognized as having some relationship to faulty nutrition in the mother, experience does not lead us to believe that much can be expected from prenatal measures. It is true that nutritional disorders in the mother require consideration and the usual recognized measures should be taken to insure healthy babies of full term but more specific treatment has failed to produce striking results. Hess and Weinstock[1] gave expectant mothers cod liver oil the last two months of pregnancy without apparently affecting the incidence of rickets in their babies. Other measures such as the prenatal irradiations by ultra-violet light have also failed.

DIETARY TREATMENT

In considering the prevention and treatment of rickets from a dietary standpoint we have to bear in mind that milk, either human or animal, is the universal food for infants.

Human milk possesses antirachitic properties to a greater degree than any other food. The incidence of rickets among nursing infants is far less than in those fed on cow's milk. The reason for this is unknown, but it is agreed that it is not entirely due to its greater content of antirachitic vitamin. Human milk is not, however, to be considered a specific for either the prevention or the cure of rickets. We must remember that the vast increase in the incidence of rickets in the seventeenth century, a wave of such great proportions that it involved most of Europe and led to the formation in England of the commission headed by Glissen, occurred at a period when all babies were breast fed. The incidence of rickets of the present generation is indicated in a study by Hess[2] in New York, who showed that even well nourished breast fed babies of mothers on a generous and varied dietary developed rickets in about 33.3 per cent by March unless they received some specific therapy and in the course of the subsequent year at least 50 per cent showed definite signs. Similar observations have been recorded by other observers.

The lack of the complete protective property of breast milk has not been sufficiently recognized. This has led to the belief that the use of cod liver oil and other recognized specifics is unnecessary for the breast-fed child. Under present conditions all babies require protective therapy of some kind.

Mothers' milk may be made specifically antirachitic by irradiating the nursing mothers. Hess[3] and more recently Gerstenberger[4] have irradiated mothers with excellent results. The latter in two cases of non-healing rickets observed marked progress when this therapy was instituted. He was not able to achieve the same results by giving mothers cod liver oil.

Cow's milk contains a comparatively small amount of the antirachitic vitamin. This is not improved by modification, condensing or drying unless the specific factor is added. Neither is it possible to increase the antirachitic properties of milk by improving the hygienic conditions of the cow. Little difference is noted in the antirachitic titer of milk when the cows are exposed to sun or kept indoors, but it has been shown that cows exposed to ultra-violet rays from artificial sources elaborate the antirachitic factor and excrete it in the milk. The feeding of a pint of cod liver oil has been without success in increasing this factor. Hess[5] has recently reported encouraging results by feeding cows with irradiated yeast and viosterol. If this should prove practical on a universal scale, it would automatically supply the infant with the antirachitic vitamins.

The yolk of eggs furnishes a demonstrable amount of the antirachitic factor. Egg whites have no such protective value and even in small amounts may increase the intensity of the disorder.

The addition of cream and butter is thought to increase the protective value of diets. The amount of butter fat, however, necessary to appreciably increase the antirachitic factor must be regarded as having possibilities of introducing other nutritional disorders.

Fruit juices, cereals, and vegetables have no protective value.

The indirect use of the ultra-violet rays obtained by giving foods activated by sufficient exposures to produce the specific antirachitic factor is attractive. Milk, particularly dried milk, has been so treated for a number of years. Other foods, especially cereals, have also been activated. The amount of the specific factor in foods so treated is small. Therefore, the quantity required to produce satisfactory results is so large that such activated foods are advised only as adjuvants to other treatment.

An inadequate diet resulting in a subnormal gain may result in rickets. If the diet is suddenly increased to a point which results in a rapid gain in weight without a proportionate increase in length, rickets is likely to develop.

An adequate diet resulting in a normal rate of growth is the greatest protection that may be expected from a dietary standpoint.

HYGIENIC MEASURES

Measures usually included under the term "good hygiene" should not be neglected because of the beneficent effect upon the infant, but it is doubtful if any except sunlight have a pronounced effect on either the prevention or cure of rickets. Lack of exercise in a child that can not stand can be of little moment in the development of rickets. Massage and salt baths may increase the nutrition of the muscle. Fresh air, while desirable, is without specific effect. Out of door life in our latitude can not be expected to be of value if the atmosphere contains sufficient dust, smoke or moisture (fog) to exert a screening effect upon the sun's rays. Changes of climate are beneficial when they make the desirable solar rays more available.

DIFFICULTY IN EVALUATING SPECIFICS

We are fortunate in having several specific curative agents. Attempts to properly evaluate these are attended with many difficulties. Many factors have to be considered, as for example the rate of growth of the infant, the season of the year, the degree of coöperation of the mothers and the severity of the case. Other complicating factors are diarrhea, repeated upper respiratory tract infections, extreme feeding difficulties, anemia, enlarged spleen and the complicating porosis occasionally seen in children who have been bedridden. Premature infants and twins usually require intense treatment by two or more specific agents.

COD LIVER OIL

A consideration of the several specifics for rickets must give first place to cod liver oil. From the time that it was first used early in the eighteenth cenutry until recently its specificity has been frequently questioned and occasionally denied. Kassowitz,[6] an authority of his time, introduced the use of elementary phosphorus which he suspended in cod liver oil. He attributed his excellent results entirely to the phosphorus. Compere[7] has again recently raised the question as to the value of phosphorus combined with the oil. The conclusions of both men have been questioned by Hess,[8] who recognizes the calcification of the bone following the use of this drug but points to the failure of calcification of the proliferating cartilage.

That cod liver oil is today universally acknowledged as a specific is due probably first to Mellanby,[9] who, in the course of his experimental study of rickets in dogs, published roentgenograms which left no doubt that calcification of the epiphyses can be brought about by the administration of cod liver oil. Park and Howland[10] and others corroborated this work. In addition, other investigators have shown its favorable effect on the calcium and inorganic phosphorus of the blood.

The proper dosage of cod liver oil depends upon several factors, the most important of which is the rate of growth of the infant. As a preventive measure it may be given in five drop doses to a child of two weeks. This may be gradually increased so that at four months the child is taking one teaspoonful two or three times daily, depending upon the other antirachitic measures employed. As a curative agent larger doses are necessary. If indicated, a dessertspoonful two or three times daily may be given and is usually easily tolerated at the sixth month.

Like all specific remedies, cod liver oil may occasionally fail to prevent or cure rickets. Failures may be due to the refusal of the baby to take the oil. Such refusals are augmented by neurotic mothers who dislike the odor of the oil and make this apparent. Occasionally the oil is regurgitated. Perseverance for a week or two in either of these conditions usually results favorably. Failure to prevent rickets in breast fed babies is occasionally encountered. This may be due to too low dosage of cod liver oil but the low calcium and phosphorus content in mother's milk has to be considered in such cases. In the rare cases of frank rickets where partial failure follows the use of oil it is probably due to the impossibility of giving sufficient of the antirachitic factor. This condition is obviously easily handled by adding ergosterol to the oil, a combination usually necessary for premature infants and twins. Untoward results need not be feared as the toxic dose of ergosterol is approximately forty times the normal therapeutic dose.

Another possible factor in the failure of cod liver oil is the doubt thrown by Hess on the question as to whether what we recognize as Vitamin D is really a vitamin. It is quite possible that there is an unknown factor in the etiology of rickets not as yet discovered.

VIOSTEROL

By far the most potent specific for rickets is irradiated ergosterol. This drug has been known to have marked antirachitic properties for about six years. Its discovery was made during investigations on cholesterol, which was first thought to contain the antirachitic factor. Investigations in chemical and clinical laboratories led to the recognition of ergosterol as a precursor of the antirachitic vitamin. Ergosterol has been known to be a derivative of ergot and fungi, but nothing was known as to its distribution in the skin and other tissues. When this was recognized it was already known that it could be activated by a small intensity of ultra-violet radiations.

The recommended dosage of irradiated ergosterol has undergone great variations during the few years it has been available for clinical use. This is due to the lack of standardization. The potency of the viosterol now on the market as authorized by the Wisconsin Alumni Research Foundation is 250D. The most comprehensive and practical work on the dosage of viosterol was done by Julius H. Hess[11] and his associates. His observations were made with viosterol 100D except his studies on the effect of massive doses when potencies up to 1000 D were used.

It is difficult to give exact rules for the optimal dose of viosterol 250 D. It may be safely stated, however, that freedom from rickets can be expected if an infant gaining at a normal rate is given from 8 to 10 drops daily, provided the drug is started during the first weeks of life. Premature and rapidly gaining infants must be given larger doses. May[12] suggests that 30 to 60 drops of 100 D (18 to 24 drops of 250 D) is "an effective range for the prevention of rickets in premature infants."

For the care of mild cases of rickets, 15 drops daily should be sufficient. Cases of moderate degree will require 20 drops daily. For the florid cases now rarely seen, larger doses may be required. Results may be obtained if the maximum doses are given only a few times a week. Because of the possibility of toxic symptoms developing it may be well when exceptionally large doses are given to control the medication by occasional estimation of the calcium and inorganic phosphorus of the blood.

ULTRA-VIOLET RADIATIONS

Ultra-violet radiations (290 to 313 millimicrons), a reliable and potent specific for rickets, is associated with the names Huldschinsky[13] and Rollier.[14] The latter was the first to make a definite statement to the effect that sun was the treatment of choice in the cure of rickets. The results are due to a photochemical reaction upon a definite chemical substance. This substance produces among other changes a calcification of the epiphyses easily demonstrated by roentgenograms. The effect on metabolism as demonstrated by Orr,[15] Holt and their colleagues is an increased retention of calcium and phosphorus.

Ultra-violet radiations are obtainable from direct exposure to the sun's rays and from artificial sources such as air-cooled mercury vapor lamps and the arc lamps.

When heliotherapy is the treatment of choice some consideration as to the number of hours of available sunlight is necessary, as well as an estimation of the quality and intensity of the rays. Unfortunately during the winter months, the period when heliotherapy is most needed, the relation between the sun and the earth is such that only a small part of the desirable band of rays is available. The short rays do not reach the earth and the longer ones are diminished in intensity. Moisture (fog), smoke, and dust act as filters. Rays reflected by water or snow and sky shine are valuable. Sky shine has been estimated by Tisdale and Brown[16] as being from one-half to two-thirds as effective as sunshine.

Solar rays when available produce different effects from the more accurately controlled radiations from artificial sources. Clinically this is shown on the skin by ruddier color, an increase of elasticity, an improved texture and a firmer connection with the subcutaneous tissue. The muscles show increased turgor and bony changes (particularly craniotabes) show rapid healing. The roentgenograms are again the most important criteria of progress.

The technic depends upon the month of the year and is wholly empiric not only as to the length of exposure but also as to the amount of skin exposed. It is to be remembered that some of the spontaneous cures of rickets occurring in the spring are in babies who are out of doors a comparatively short time and have only their face and possibly their hands exposed. Our method beginning as early in the spring as the weather will permit is as follows: The legs are exposed for a period of 15 minutes. The following day the legs are again exposed for the same period and then in addition the thighs uncovered for 15 minutes. On the third day this procedure is repeated and an additional 15 minutes of exposure is given to the lower abdomen and buttocks. This method is followed until the entire body has been exposed, unless contra-indications develop. Over-exposure is usually followed by pallor and fever. The skin of infants varies widely as regards the amount of radiations that can be tolerated without producing the very slight flushing that is desirable. It is well known that blondes are far more sensitive to the ultra-violet rays than are brunettes but there are exceptions to this rule. Caution must be exercised at the beginning of the treatment. The mothers should be advised that the tan resulting from ultra-violet rays is not the object of the exposures.

Ultra-violet rays produced artificially are much more easily controlled and much more available in this vicinity than the solar rays. The rays from the carbon arc lamp more nearly approach the solar rays but unfortunately the apparatus has many practical drawbacks. The mercury vapor light gives a ray of shorter wave lengths than the sun.

The treatment here again is empirical and the same caution is to be used as with solar radiation. Our technic is as follows: The exposures are given to the entire body at a distance of 27 inches. The first exposure is for one minute anteriorly and posteriorly. On the third day the exposure is lengthened to two minutes, if there are no contraindications. The exposures are increased one minute every second day until the child is getting seven minutes anteriorly and posteriorly. It is usually possible in this way to give approximately an hour of ultra-violet radiations in two weeks. The usual precautions are taken to prevent injury to the eyes.

The effect is as remarkable and is as easily demonstrated as with the other specifics. Within two weeks new calcification in the epiphyses and carpal centers is demonstrable with the roentgenograms. Clinical improvement is also readily demonstrable.

Hess emphasizes the fact that neither radiations from sun nor from artificial sources produces an indefinite immunity. Attacks of recurrent rickets may develop later in spite of a thorough course of irradiation.

The dosage of the several specifics has been discussed on the premises that each was to be used alone. Such a course is rarely advisable. For example in one case the frequency of upper respiratory tract infections occurring as a complication of the rickets may suggest the use of cod liver oil in order to gain the benefits of Vitamin A but a digestive disturbance may prevent adequate dosage. It may then be advisable to increase the potency of the oil by adding viosterol. Anemia may suggest another combination of specifics, particularly one which includes ultra-violet radiations. Other complications will demand various combinations of the specifics.

Enthusiasm over the results obtained from one tried specific must not permit us to ignore the benefits that can be obtained from other measures. Rarely is it advisable to adhere to one specific in the treatment of any given case. In no instance must our enthusiasm over the treatment of the rickets allow us to overlook the welfare of the patient.

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THE RELIEF OF PAIN IN ADVANCED TUBERCULOSIS OF THE LARYNX BY MEANS OF SURGERY*

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THE relief of pain on swallowing is of the utmost importance in the treatment of laryngeal tuberculosis, because as a consequence of pain, there is a diminished intake of food, leading to the rapid failing of the patient. In the past eighteen months, I have had the opportunity of bisecting the internal branch of the superior laryngeal nerve five times, at Glen Lake Sanatorium, for the relief of the dysphagia. The object of this discussion is to call attention to the symptomatic value of resection of the superior laryngeal nerve in far-advanced tuberculosis of the larynx. What the value of this procedure has in the cure of tuberculosis of the larynx must be left for further observation.

CLINICAL APPLICATION

Application of various remedies to the larynx for dysphagia has never been satisfactory. It gives relief for only a short time or sometimes does not help at all and must be repeated too often. This type of treatment would be applicable only where there are small ulcers.

The injection of alcohol into the superior laryngeal nerve, to relieve the pain in tuberculosis of the larynx, as introduced by Hoffmann, has been frequently resorted to. There are many objections to this method. The success of the injections naturally varies with the skill of the operator, and when relief from pain is gained, the duration of the anesthesia fluctuates from a few hours to two months. If it becomes necessary to repeat the injection, it is found that after the first injection all subsequent injections are less likely to be successful, probably because of the development of connective tissue adhesions. Again it has been noted that at times the pain reappears with greater severity after the injection of alcohol. Another disadvantage to the injection of alcohol into the superior laryngeal nerve, worthy of mention, is the possibility of paralysis of the tongue. This is due to the effect of the alcohol extending into the closely related hypoglossal nerve (Fig. 3).

However, the bisection of the internal branch of the superior laryngeal nerve for the dysphagia of tuberculosis of the larynx has many advantages. The surgeon should perform this simple operation when nourishment becomes impossible, on account of dysphagia, because it presents no technical difficulties and is the surest method of removing dysphagia in patients afflicted with laryngeal tuberculosis. The operation has hardly any contraindications.

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*Presented before the meeting of the Minnesota Academy of Medicine, October 14, 1931.

The internal branch of the superior laryngeal nerve, besides furnishing the sensory fibers to the mucous membrane of the larynx, also furnishes motor branches to the interarytenoid muscles (Fig. 1). This muscle assists in the approximation of the posterior half of the vocal

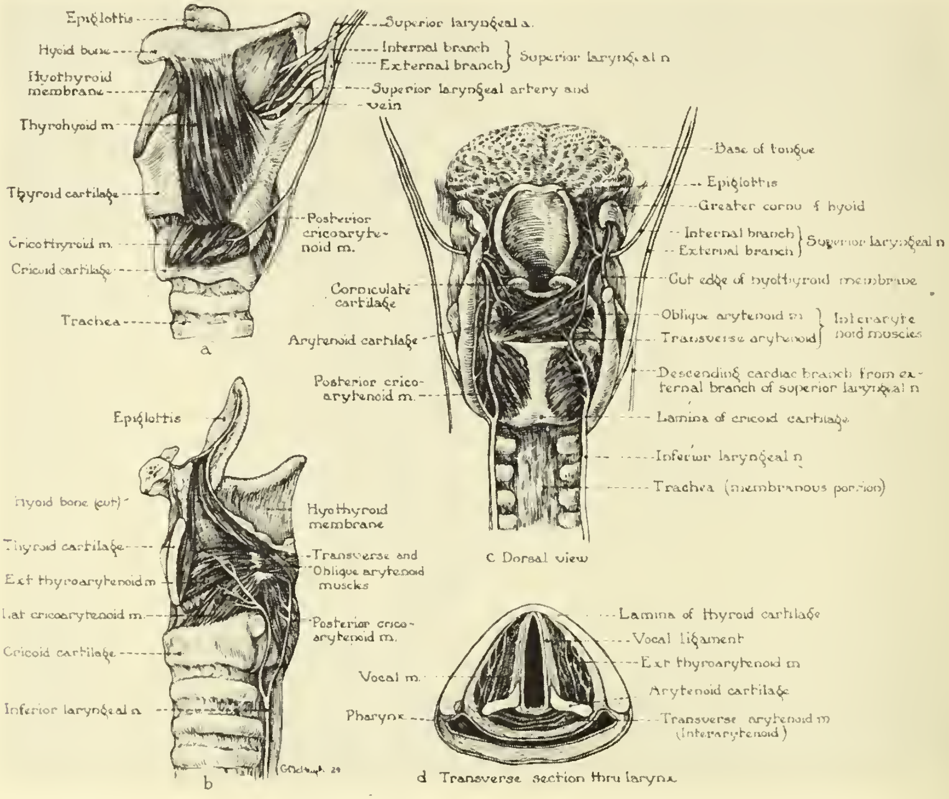
Epiglottis
Hyoid bone
Hyothyroid membrane
Thyrohyoid m
Thyroid cartilage
Cricothyroid m.
Cricoid cartilage
Trachea
a
Superior laryngeal a.
Internal branch
External branch
Superior laryngeal n
Superior laryngeal artery and vein
Posterior cricoarytenoid m.
Base of tongue
Epiglottis
Greater cornu of hyoid
Internal branch
External branch
Superior laryngeal n
Corniculate cartilage
Cut edge of hyothyroid membrane
Oblique arytenoid m
Transverse arytenoid
Interarytenoid muscles
Arytenoid cartilage
Posterior crico-arytenoid m.
Descending cardiac branch from external branch of superior laryngeal n
Lamina of cricoid cartilage
Inferior laryngeal n
Trachea (membranous portion)
C Dorsal view
Epiglottis
Hyoid bone (cut)
Hyothyroid membrane
Thyroid cartilage
Ext thyroarytenoid m
Transverse and Oblique arytenoid muscles
Lat cricoarytenoid m.
Posterior crico-arytenoid m.
Cricoid cartilage
Inferior laryngeal n
b
Lamina of thyroid cartilage
Vocal ligament
Ext thyroarytenoid m
Vocal m.
Arytenoid cartilage
Pharynx
Transverse arytenoid m (Interarytenoid)
d Transverse section thru larynx

Fig. 1. Dissection of the larynx to show the intrinsic muscles and distribution of the laryngeal nerves. Note muscular distribution of internal branch of superior laryngeal nerve. (Modified from Jackson.)

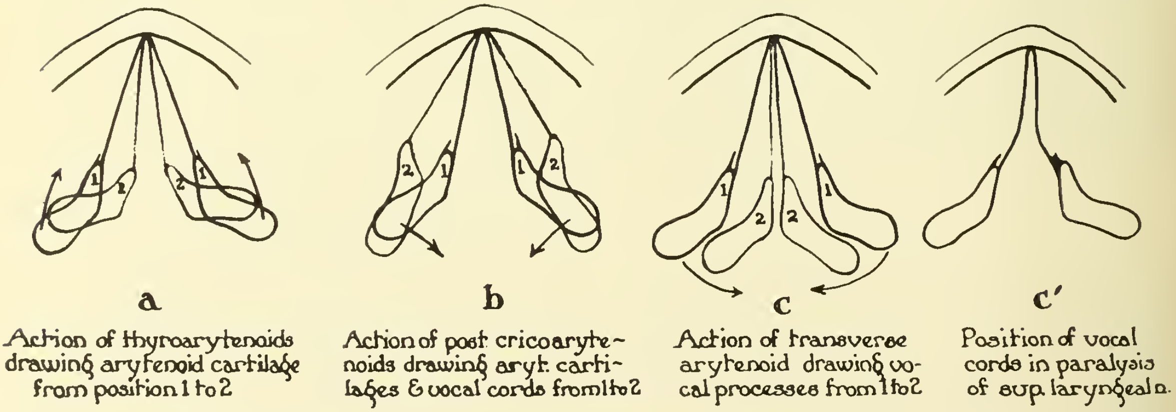
1
2
a
Action of thyroarytenoids drawing arytenoid cartilage from position 1 to 2
b
Action of post. cricoarytenoids drawing aryt. cartilages & vocal cords from 1 to 2
c
Action of transverse arytenoid drawing vocal processes from 1 to 2
c′
Position of vocal cords in paralysis of sup. laryngeal n.

Fig. 2. Action of the laryngeal muscles. *A*, Action of thyro-arytenoids drawing arytenoid cartilage from position 1 to 2. *B*, Action of posterior crico-arytenoids drawing arytenoid cartilages and vocal cords from 1 to 2. *C*, Action of transverse arytenoid drawing vocal processes from 1 to 2. *C′*, Position of vocal cords in paralysis of superior laryngeal nerve. (Modified from Jackson.)

cords. Therefore, the bisection of the superior laryngeal nerve in the treatment of far-advanced tuberculosis of the larynx has a distinct advantage over other methods, in that it assists in the carrying out of two of the basic principles in the treatment of tuberculosis, namely, that the patient is able to take the proper amount of nourishment, because of the relief from the severe pain of swallowing, and second, because the vocal cords are partially immobilized through the paralysis of the interarytenoid muscles (Fig. 2).

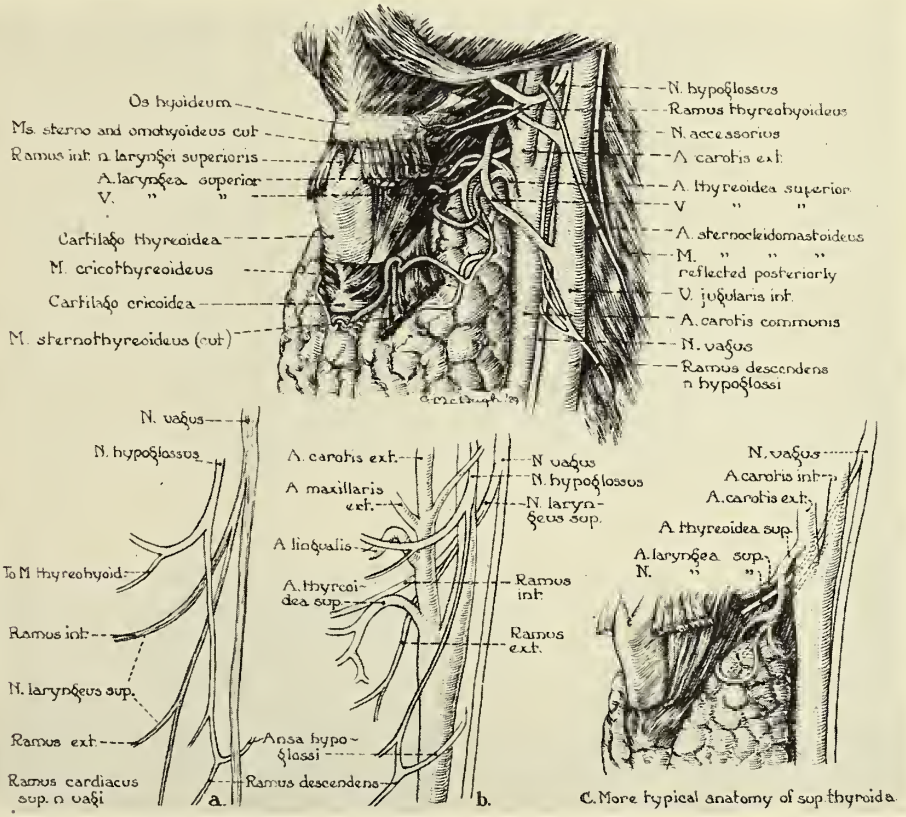
Os hyoideum
Ms. sterno and omohyoideus cut
Ramus int. n. laryngei superioris
A. laryngea superior
V. " "
Cartilago thyreoidea
M. cricothyreoideus
Cartilago cricoidea
M. sternothyreoideus (cut)
N. hypoglossus
Ramus thyreohyoideus
N. accessorius
A. carotis ext.
A. thyreoidea superior
V " "
A. sternocleidomastoideus
M. " " "
reflected posteriorly
V. jugularis int.
A. carotis communis
N. vagus
Ramus descendens
n. hypoglossi
N. vagus
N. hypoglossus
To M. thyreohyoid
Ramus int.
N. laryngeus sup.
Ramus ext.
Ramus cardiacus
sup. n. vagi
a.
A. carotis ext.
A. maxillaris
ext.
A. lingualis
A. thyreoidea sup.
Ansa hypoglossi
Ramus descendens
N. vagus
N. hypoglossus
N. laryngeus sup.
Ramus int.
Ramus ext.
b.
N. vagus
A. carotis int.
A. carotis ext.
A. thyreoidea sup.
A. laryngea sup.
N. " "
C. More typical anatomy of sup. thyroid a.

Fig. 3. Dissection to show the extralaryngeal relations of the superior laryngeal nerve. (Nordland.)

THE ANATOMICAL CONSIDERATION

The object is to expose and bisect the nerve at the most favorable point. For this purpose, it is best to select the course along the hyothyroid membrane. The superior laryngeal nerve arises from the ganglion nodosum of the vagus (Figs. 1 and 3), and, after a short course, divides into two branches, a small external and a large internal branch. The external branch passes downward and mesialward and is finally distributed mainly to the cricothyroid muscle, which tightens the cords. The internal branch passes medially and enters the larynx through the thyrohyoid membrane. It furnishes sensory fibers to the mucous membrane of the larynx as well as motor fibers to the interarytenoid muscle. It occasionally gives off an anastomotic branch to the recurrent laryngeal nerve. The superior laryngeal nerve from its origin lies parallel to and in close proximity with the superior thyroid artery and its branches. The surgical importance of this fact will be referred to later. In the region of the hyothyroid membrane, the nerve is covered by the stratification of the sternohyoid, omohyoid and thyrohyoid muscles.

THE OPERATION

The instruments are the same as those used for the ligature of the superior thyroid artery. The patient is placed in the same position as for thyroidectomy. A few c.c. of 2 per cent solution of novocain are injected subcutaneously at the site for the intended incision. An incision

6 to 7 cm. long parallel to the hyoid bone is made, which extends midway between it and the upper margin of the thyroid cartilage, across the border of the sternomastoid muscle. After dividing the skin, platysma and fascia, the anterior border of the sternomastoid muscle is freed and retracted (Fig. 4). The external jugular vein and great auricular nerve are carefully avoided in the posterior part of the wound. The omohyoid muscle, coming from under the sternomastoid muscle, is then freed along its outer border and drawn inward. If the loop of the superior thyroid artery has not come into view, the large anterior branch between the larynx and the upper pole of the gland serves as a guide. By following this guide, we find the main trunk of the artery lying on the outer surface of the inferior constrictor of the pharynx with the superior laryngeal nerve situated only a little higher up.

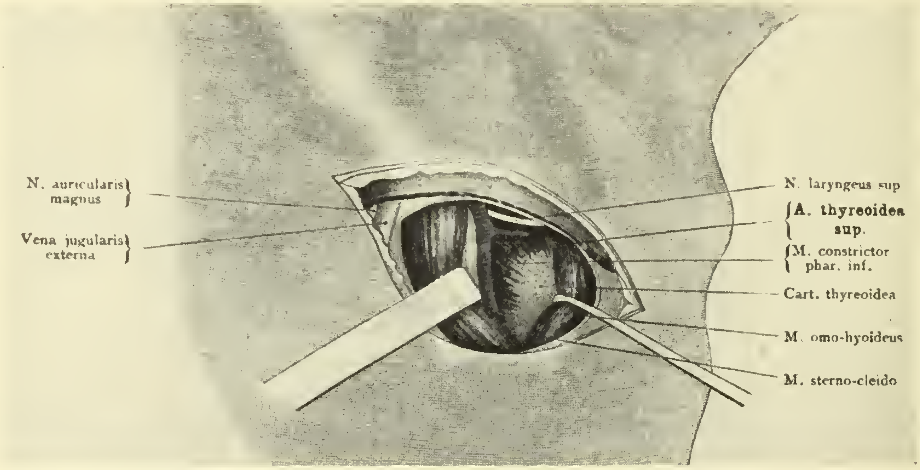

Fig. 4. The incision for the bisection of the internal branch of the superior laryngeal nerve.

Valuable time should not be lost in the application of other methods which will give only temporary relief. Because of the simplicity of the operation and in order to avoid a repetition of the operation on the other side, Wachmann advises that a bilateral operation be made in the first place. Two of our patients had a bilateral operation without the slightest secondary effects. Wachmann, who reported a series of cases in 1916, in which he performed bilateral resection, noticed no trophic disturbances as the result of the resection of both nerves. The wound heals rapidly and does not leave a disfiguring scar (Fig. 5).

After the operation, all painful sensation upon swallowing food disappears immediately. When pain persists after resection of the superior laryngeal nerve, it can be assumed that the ulceration is not confined to the larynx.

In all of our cases, the dysphagia was relieved immediately. In the two cases in which bilateral bisection of the nerve was made, the patients were so much improved after the first procedure that they asked to have the second side operated upon.

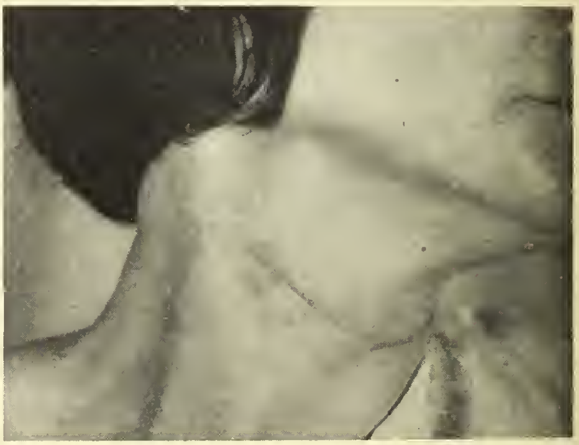

Fig. 5. Case 3. Small scar, four weeks after operation.

CASE REPORTS

Case 1.—Was that of a young man with far-advanced tuberculosis complicated by tuberculous laryngitis. The prognosis was unfavorable.

Larynx.—1. Hoarseness marked commencing January 1, 1930, progressively worse. Throat very sore. Pain on talking and swallowing. 2. Epiglottis destroyed (50 per cent). 3. Left arytenoids three times as large as right, red and inflamed. 4. Pus in posterior half of larynx. 5. True cords thickened, infiltrated and injected.

Operation.—Bisection of right internal branch of superior laryngeal nerve on April 26, 1930.

Result of operation.—Pain on swallowing much relieved. However, appetite very poor on account of general condition and therefore unable to take much nourishment. Also had many stomach symptoms which prevented eating.

Case 2.—Was that of a young woman with far-advanced tuberculosis complicated by tuberculous laryngitis. Hoarseness and occasional soreness of the throat developed early in 1930, soon after the onset of the disease. Within a month, the severe dysphagia became persistent, causing inability to eat.

Larynx.—1. Epiglottis swollen and reddened. 2. Both arytenoids swollen and inflamed. 3. Extensive ulceration right arytenoid extending into posterior commissure. 4. Right true cord pale.

Operation.—Section of right internal branch of superior laryngeal nerve on April 23, 1931. Section of left internal branch of superior laryngeal nerve on July 10, 1931.

Results of operation.—Operation on each side was followed by immediate relief from pain and marked improvement in appetite.

Case 3.—Was that of a young woman with a diagnosis of far-advanced pulmonary tuberculosis complicated by laryngitis. She had burning and soreness in her throat since 1927. Pain became gradually so severe that by May, 1931, she could not eat.

Larynx.—1. Marked bilateral soreness with pain on swallowing. Unable to eat. 2. Epiglottis three times normal size covered with white plaques. 3. Arytenoids markedly enlarged. 4. Small tuberculoma posterior commissure.

Operation.—Section internal branch of right superior laryngeal nerve on July 23, 1931. Section internal branch of left superior laryngeal nerve on August 25, 1931.

Results of operation.—Operation on right side—Immediate marked relief of all symptoms on right side of larynx. No pain on right side. Able to eat much better. Pain on left side of throat. Operation on left side—Immediate marked relief of all symptoms.

CONCLUSIONS

The resection of the superior laryngeal nerve is the surest method of removing dysphagia in patients afflicted with laryngeal tuberculosis.

The operation presents no technical difficulties and does not cause any severe secondary phenomena.

The operation can be done primarily on both sides and is easily borne by the patient.

The operation has a definite symptomatic value and may have a curative possibility.

The operation is suitable for other painful inflammatory processes in the larynx.

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THE TESTICULAR HORMONE

Experimental and clinical evidence, as well as numerous studies of transplantations, indicates clearly that the testes possess one or more endocrine functions. In the past the criteria used for determining the effects of the extracts on castrated animals were of doubtful value but more trustworthy methods have been elaborated. While the exact chemical nature of the hormone is not known, some of the chemical properties have been determined. The most active and probably purest preparation thus far obtained is one in which a dose of 0.01 mg. of the active material per capon daily causes distinct comb growth. The product acts best when injected subcutaneously or intramuscularly; the dose for action by mouth is at least ten times as high. Thus far there has been no indication that the product can be of any value in restoring "vigor" to the aged or neurasthenic. However, if there is an indication for its use and if the dosage in man is comparable to that effective in the capon, the daily injection for a man weighing 150 pounds would have to be an amount equivalent to 5 pounds of bull's testis or 2 gallons or normal male urine. If taken by mouth, the dosage presumably would have to be much larger. (Jour. A. M. A., February 27, 1932, p. 738.)

MUCOCELE OF THE APPENDIX WITH REPORT OF A CASE*

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SINCE Virchow, in 1863, first recognized cystic dilatation of the appendix, between 160 and 170 verified cases have been reported in the literature. Virchow considered this condition to be one of colloid degeneration. Rokitansky, in 1867, described four appendiceal cysts which he considered examples of colloid carcinoma, and, in 1877, Ferë first designated this pathologic entity as mucocele. Castle, in 1915, reported from the literature twenty-nine cases in a total of 13,158 records of postmortem examinations. Dodge, in 1916, after an exhaustive review of the literature, found reports of 142 cases. Of these, fifty-five were reported from necropsy, sixty-six from operation, and in twenty-one cases information as to how the study was made was not recorded or was not accessible. Davison, in 1922, added eighteen reports which he had found, together with a report of a case of his own. Since that time there have been reports of cases by Milliken and Poindexter, Weaver, Meyers, Nash, and others.

The following report is a review of the operative cases of mucocele of the appendix seen at The Mayo Clinic from 1917 to 1930, inclusive. During this time out of a total of 31,200 cases in which appendectomy was performed, there were seventy-six pathologically proved cases of mucocele. An attempt has been made to analyze the symptoms, physical findings and associated pathologic characteristics. Six cases, reported by Masson and Hamrick in 1930, were not included in this survey, leaving seventy for consideration.

Thirty-one of the patients were males and thirty-nine, females, and their ages varied from fifteen to sixty-five years, with an average of forty-two and a half years. Analysis of the laboratory work gave very little information. Studies of the blood and urinalysis were made as a routine in all cases. The number of leukocytes varied between 3,800 and 12,100 in each cubic millimeter of blood, with an average count of 7,675 for the entire group. There were no urinary findings of significance in the seventy cases. In eleven cases, analysis of gastric content was made, with variations in the total acids, in terms of cubic centimeters of tenth normal sodium hydroxide, of 70 to 6, and of free hydrochloric acid of 54 to 0.

Twenty-eight of the total number of cases were not associated with any other pathologic condition. All of these twenty-eight patients gave histories of attacks of distress in the right lower abdominal quadrant, varying from a number of years to a few days. In the greater percentage, physical examinations revealed tenderness in this region. In ten of the cases there was an operative diagnosis of acute appendicitis; in five of this number there was preoperative rupture, and in three appendiceal abscess had formed. Two of the patients with abscess had been operated on again within sixty days of the original drainage, and the mucocele was identified at this operation. Forty-two of the total number of patients were operated on for associated pathologic conditions, and, in each case, the symptoms were that of the major condition. Five of these patients gave additional histories of distress in the right lower abdominal quadrant, sufficient to arouse suspicion of recurrent appendicitis. In fourteen of these forty-two cases the condition was associated with cholecystic disease; in twelve, stones were present. There were twelve cases of duodenal ulcer, and two cases of gastric ulcer. One case was identified when the appendix was removed in the course of repair of a postoperative ventral hernia, and another was associated with a perforating carcinoma of the sigmoid.

From this review it would seem that the most significant physical finding, besides the tenderness on pressure in the right lower abdominal quadrant, was a palpable mass in this region. Fourteen patients had a palpable mass in the right lower abdominal quadrant, in seven of which it was proved, at operation, to be due to the mucocele. In the other cases, the mass was due to associated pelvic pathologic conditions. In none of these fourteen cases was a preoperative diagnosis made or suggested. Many cases have been reported in which there was error in diagnosis; the tumefaction in the right lower abdominal quadrant has been mistaken for ovarian cyst, floating kidney, pedunculated uterine fibroid tumor or a malignant condition of the small or large bowel.

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*From the Section on Surgery, The Mayo Clinic, Rochester, Minnesota. Submitted for publication October 19, 1931.

The majority of those who have studied this condition believe the following to be the facts that are involved in the formation of mucocele: There must be complete, or almost complete, obliteration of the lumen of the appendix. This must be associated with an actively secreting mucous membrane, secreting mucus in excess of absorption, and with some change in the mucosa whereby the normal mucus is changed into pseudomucin. This change should take place in an aseptic field; otherwise, empyema or gangrene would result.

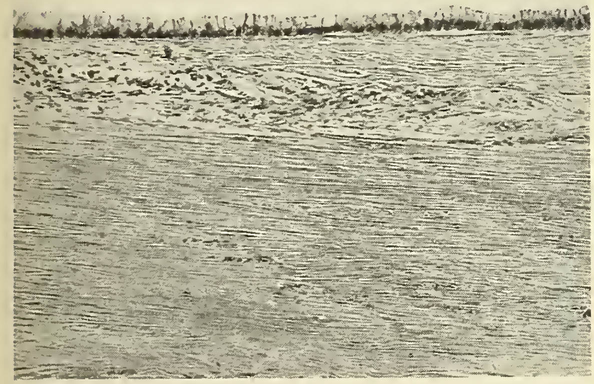

Fig. 1. Section obtained in study of the case reported in this paper. A single layer of tall, columnar epithelium is replacing the normal mucosa.

Microscopically, in the cases we have seen, there has been a change in the height of the mucus-producing cells. Associated with this there is a gradual reduction in number, and the larger the growth, the greater the destruction of the cells. Wellbrock's opinion is that the possibility of this growth being the precursor of colloid carcinoma of the appendix should be considered. Such a growth may be primary, comparable to relatively benign tumors of other parts of the body. That some doubt as to the theory of formation should be entertained is shown by the fact that the number of cases of mucocele of the appendix, in contrast with the number of cases in which the appendixes present obliterated lumens, is very small (Fig. 1).

The most interesting complication of mucocele of the appendix is rupture, with the resulting formation of pseudomyxoma peritonæi. This condition is analogous to that which occurs from ruptured pseudomucinous ovarian cyst, which may be benign or malignant. Masson and Hamrick, following their study of six such cases complicated by rupture, came to the conclusion that the prognosis in pseudomyxoma peritonæi of appendiceal origin is better than in that of ovarian origin; this is due largely to the fact that the exudate, in its escape from the appendix, may be limited to the right iliac fossa.

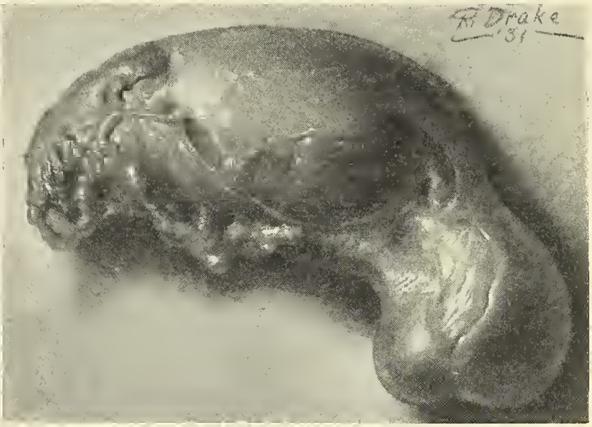

Fig. 2. The mucocele of the appendix in the case reported.

The prognosis in uncomplicated cases is good. There were no deaths in any of our series, and the mortality rate is that of simple appendectomy.

The following is a report of a recent case of mucocele of the appendix in which operation was performed at the clinic.

REPORT OF A CASE

A man, aged sixty-six years, came complaining of failing vision. His general health had always been good except for a tendency to be habitually constipated. For six years previous to his admission he had known of an asymptomatic mass in the right lower abdominal quadrant. Physical examination was negative except for discovery of this mass. A roentgenogram of the colon disclosed an extracecal mass in the angle between the terminal portion of the ileum and the cecum. Urinalysis gave negative results; the concentration of hemoglobin was 12.3 gm. in each 100 c.c. of blood, and leukocytes numbered 5,400 in each cubic millimeter of blood. Operation was advised, and, under spinal anesthesia, a large mucocele of the appendix, resembling in shape a stubby banana, was removed. The specimen was a mucocele, 11 by 4 by 4 cm. (Fig. 2) in various dimensions. In the wall, which was thickened, there was marked fibrosis and hyalinization, with some deposit of calcium. The mucosa was replaced by a single layer of columnar epithelium; the submucosa and muscularis were one continuous mass of fibrous, hyaline tissue containing scattered and collected lymphocytes. The patient's convalescence was uneventful and he was dismissed as cured in fourteen days.

SUMMARY

Seventy cases of mucocele of the appendix are reviewed. In this clinical analysis no definite diagnostic point has been revealed. The most significant facts are the history of distress and palpable mass in the right lower abdominal quadrant. With this present, mucocele of the appendix should always be considered. In uncomplicated cases, the condition is relatively benign. Although mucocele may be a primary type of malignant tumor, its growth is exceedingly slow, and complicating factors are rare. Rupture of larger mucoceles frequently results in the formation of pseudomyxoma peritonæi. The treatment of the uncomplicated case is appendectomy, and the prognosis is good.

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SYNTHALIN

No preparations given orally are of proved value in the treatment of diabetes. Synthalin, which has been given the most extensive trial, does seem to be beneficial in an occasional case, but Synthalin is far from being nontoxic and in some patients it produces liver damage. It seems best at present to use insulin and nothing else. (Jour. A. M. A., February 13, 1932, p. 573.)

CASE REPORT

CARCINOMA OF THE LUNG*

William S. Middleton, M.D.
Madison, Wisconsin

A white male laborer, fifty years of age, presented himself to the Wisconsin General Hospital complaining of weakness. His disability began fifteen months previously with a "grippy" attack and at that time he had been told that there was considerable congestion of the right lung. Within a period of two weeks he recovered sufficiently to return to work, a weight loss of 15 pounds having occurred during the period of bedfastness. His strength was not regained, and from time to time he was forced to give up his work. Weakness was the outstanding complaint. Constipation and gaseous distention supervened.

Eleven months after the acute onset of symptoms a new position was obtained with lighter duties occupying him nine hours a day. The fatigue was still so oppressive that he could scarcely walk home in the evening. His appetite failed. After six weeks he became so fatigued that he quit work and stayed in bed for a week. The physician, consulted at the end of this period, determined a fluid accumulation in the right pleural cavity. Three quarts of a reddish tinged fluid were withdrawn and pronounced negative to tuberculosis by laboratory studies. On two subsequent occasions thoracenteses obtained 16 and 6 ounces, respectively, of a clear straw colored fluid.

The inventory by systems established the rapid development of a large nodule on the head over a period of seven months. A febrile reaction ranging to 100° F. had been noted on frequent occasions since the onset. Palpitation occurred occasionally after heavy meals. Dyspnea had progressed over the past five months. A weight loss of 25 pounds had been noted in the past fifteen months.

The past medical history included the usual diseases of childhood. There was an attack of scarlet fever at one year of age, pneumonia at twenty and frequent respiratory infections. A serious laceration to the lateral side of the left knee from a logging hook twenty-five years previously had resulted in a suppurative arthritis with subsequent ankylosis of the knee joint.

The social history was irrelevant, but the family history elicited the occurrence of a neoplasm (probably carcinoma) in the paternal grandmother, tuberculosis in a paternal uncle and a cousin, and insanity in the paternal grandfather and uncle. The contact with the tuberculous relatives had been problematic.

The physical examination developed the following pertinent findings:

Emaciation. A firm nodule, 4 × 6 cm., in the right fronto-parietal region. Perforation in the anterior portion of the bony nasal septum. Diffuse enlargement of the thyroid gland.

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*From the Department of Medicine, University of Wisconsin Medical School. Presented before the Mississippi Valley Conference, St. Paul, September 21-23, 1931.

Right shoulder lower than left; retraction of the right supra- and infra-clavicular spaces; narrowing of the interspaces on the right; total absence of respiratory excursion at the right apex with gross decrease at the base; tactile fremitus, resonance, breath sounds and voice sounds decreased to absence on the right side except for a small zone above the third rib anteriorly where the breath sounds were almost amphoric and the voice sounds, egophonous; compensatory hyperresonance and exaggerated breath and voice sounds on the left. (The pitch and quality of the percussion note changed from woodeny tympany in the recumbent position to dullness in the upright posture over the second and third right interspaces. No bell tympany, succussion splash nor metallic tinkle were demonstrable over this area; but two days later a typical bell tympany was elicited to the coin test over the third to fifth interspaces on the right.)

Heart displaced to the left.

Left knee fixed in 25° flexion with considerable increase in circumference. Attendant atrophy of left thigh and leg.

In evaluating the physical findings the staff concurred in the opinion of an irregularly pocketed hydropneumothorax; but the history of its course gave much food for thought and discussion. The family history of tuberculosis and the patient's suppurative arthritis were given due attention. The mode of onset was voted suggestive for tuberculosis. Weight loss was an equivocal factor. Had the pleural fluid been serosanguinous on all occasions rather than on a single aspiration, the differentiation would have been simplified. Importantly, cough and sputum had been singularly missing from the picture. Accordingly the laboratory was called upon for assistance.

Important among these findings were the persistent chlorotic type of anemia (4.7 millions erythrocytes with 50 per cent hemoglobin) and the negative sputa. A polymorphonuclear leukocytosis (10,150 to 14,950 with 84 to 93 per cent neutrophiles) pertained. The blood Wassermann reaction was negative. The roentgenogram of the skull revealed a bony defect beneath the site of the visible nodule. The stereoscopic roentgenograms of the chest (Fig. 1) showed the following details: Trachea was visualized in the midline. The right vertebral, first and second interspace distributions showed some fibrous thickening and there was a granular increase in density in the left first interspace. The radiolucency on the right was greatly decreased and a cascading series of horizontal fluid levels with elliptical zones of rarefaction above each was observed at various levels in the right thorax. The opacity of the right lung field obscured the right border of the heart, the mediastinum and the diaphragm.

While the persistently negative sputa argued against diagnosis of pulmonary tuberculosis, the first directional support for a neoplasm of the lung came in the roentgenologic evidence of a bony defect beneath the parietal nodule, which continued to increase in size after the patient's entrance to the hospital. Not until the twentieth day after admission did the opportunity for a biopsy present itself in a small firm nodule in the right pectoral chain of lymphatics. (The surgeons had advised against section of the cranial nodule.) The sections of this node were diagnosed carcinoma.

The clinical course during the period of hospitalization was marked by steady weight loss, recurrent accumulations of serous and later sero-sanguinous fluid in the right pleural cavity, afternoon fever ranging from 99.4 to 101.2° F. and extreme dyspnea. Very late in the course of the disease there were several small hemoptyses. The patient died on the fifty-third day after entrance.

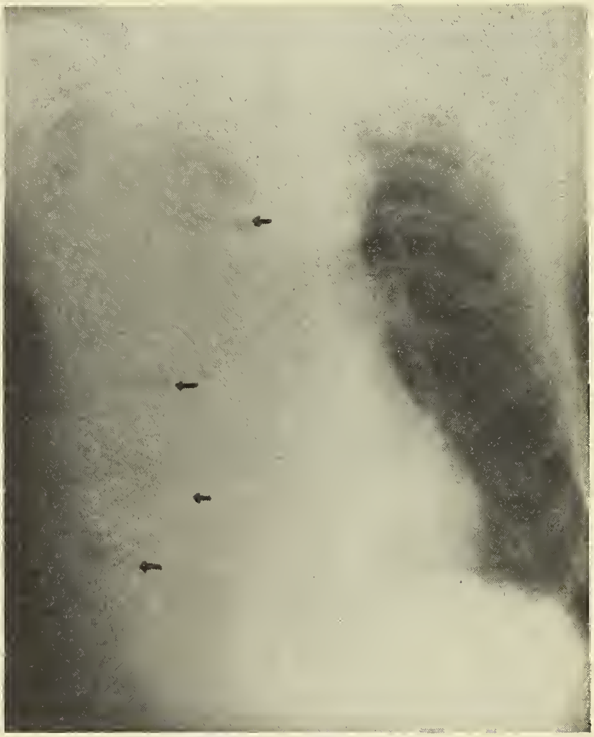

Fig. 1. Roentgenogram of chest. Arrows indicate several fluid levels.

The postmortem examination as reported by Dr. Gorton Ritchie was especially interesting in the details related to the primary neoplasm and its metastases. The right lung was found to be totally collapsed with a dense pleural covering, cartilaginous in consistency. The lung substance was atelectatic, doughy, greyish green in color with numerous strands of white tissue, cartilaginous to the knife, extending throughout the same. These white trabeculæ were especially prominent at the lines of the interlobar septa. The bronchi were considerably stenosed and the tracheo-bronchial nodes were involved in a mass of this cartilage-like tissue. At the base of the right lung was a large mass of firm, elastic tissue involving the whole right leaf of the diaphragm. This tumor was densely adherent to the body wall in all directions and the diaphragm beneath was 1.5 cm. thick.

The liver contained numerous umbilicated light colored nodules; and on section the exposed surfaces of all portions of the organ were studded with many firm white nodules. These were contrasted with the congestion of the remainder of the surface.

The histological study of the tumor and metastases in the liver and bronchial lymph nodes showed an alveolar type of atypical epithelial growth in the main (Fig. 2). There was a small amount of connective tissue stroma in the same. Many tumor cells showed vacuolation and degenerative changes in the nuclei. In places there appeared a dense overgrowth of fibrous connective tissue. There was some bone formation. Very importantly some portions appeared to have been derived from bronchial epithelium.

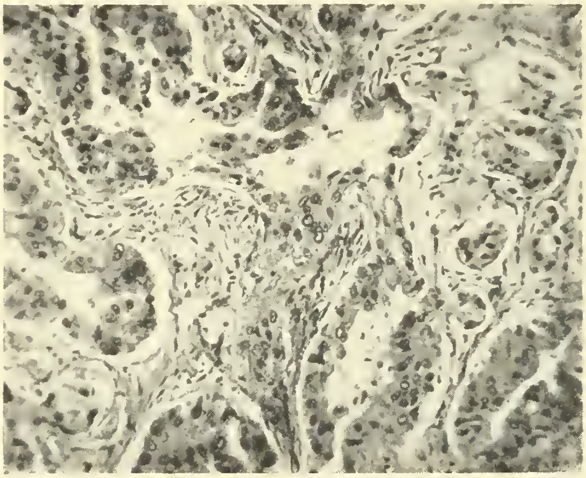

Fig. 2. Photomicrograph of histologic section of carcinoma. Courtesy Dr. Gorton Ritchie.

This patient well illustrates many of the difficulties presented in arriving at a differential diagnosis between primary carcinoma and tuberculosis of the lung. Pleurisy with effusion, weakness, weight loss, afternoon fever and chest signs, particularly in a patient with a history suggestive of exposure to tuberculosis and a definite antecedent suppurative arthritis might well arouse the suspicion of a tuberculous background. The occurrence of a serosanguinous effusion favored neoplasm. The absence of a cough, persistently negative sputa and conspicuous dyspnea also pointed toward this conclusion. It remained for the laboratory to suggest the diagnosis in the lead afforded by the cranial defect and to clinch the same in biopsy findings on the lymph node from the pectoral chain. Interestingly, histologic studies of materials obtained at necropsy indicated that the carcinoma of the lung was of the rarest type, alveolar-celled. Carcinomata from the bronchial mucous glands and from the bronchial epithelium are more common. Objection was raised at the time of the biopsy report to the suggestion of a bronchial origin. As a rule such cases have persistent cough and blood streaking of the scanty sputum as relatively early symptoms, whereas in this case cough was never a volunteered symptom and small hemoptyses occurred very late in the course. It is difficult to account for the absence of pain in this case unless it resulted from the stoicism of the patient.

The symptoms of carcinoma of the lung vary widely with the nature of the lesion, its location and direction of extension, encroachment upon the lumina of bronchi or surrounding structures, pleural involvement and metastastic routes. In the present relation, time is not afforded to discuss this matter in any detail. Whenever the question of the differentiation between primary carcinoma and tuberculosis of the lung arises, the clinician must bear in mind the frequency with which cardinal symptoms of tuberculosis, persistent cough, hemoptysis, fever, pain, dyspnea and weight loss are seen in carcinoma of the lung. In qualification it should be stated that the pain of neoplastic infiltration is rarely pleuritic. It may be sharp or dull, but rarely does it have the same relation to respiration as does pain in tuberculosis. Dyspnea is far more common and distressing in carcinoma than in tuberculosis. The question of fever in carcinoma of the lung is an interesting one. Professor Riesman has for many years taught that not only is carcinoma of the lung the tumor most frequently attended by fever but also that fever should suggest rather than refute such a diagnosis. In the experience at the Wisconsin General Hospital necrosis is a more common explanation for this febrile reaction than infection.

The physical findings of primary carcinoma of the lung may be negligible or absent for a considerable period of time. If present, several factors modify them, namely accessibility, bronchial encroachment and pleural involvement (with or without effusion). Since the bronchogenic type of carcinoma (mucous glandular and epithelial) occurs much more frequently than the alveolar form, particular attention should be paid to alterations in the aeration and vibratory phenomena of the several lobes of the lungs of patients in whom the suspicion of pulmonary tuberculosis can not be confirmed by ordinary laboratory measures.

In the hands of qualified experts bronchoscopy offers the greatest promise of success in the diagnosis of carcinoma of the lung, especially of the bronchogenic order. The direct visualization of the lesion is possibly less useful and certainly less convincing to the general practitioner than the biopsy materials so obtained. The roentgenogram is helpful in a certain proportion of cases. In the general hospital this aid is not as widely applicable as one might judge theoretically. The wedge or triangular shaped infiltration, base to hilum and apex to periphery, should suggest this lesion in the majority of instances of bronchogenic carcinoma seen before wide extension or pleural involvement has masked the picture. The unilateral solitary nodule or mass in the lung field may by progress studies be definitely defined as a neoplasm, but abscess, gumma, infarct and other conditions must enter into the consideration for differentiation. The metastases to accessible lymph nodes frequently afford a fortunate diagnostic aid to the hard-put clinician. Not uncommonly these metastases in the immediate supraclavicular, axillary and pectoral nodes are very small and inconspicuous. Where the thought of a primary carcinoma of the lung is entertained, particular search should be made for these invaluable guides.

In so far as the diagnostic results are concerned, the experience at the Wisconsin General Hospital is probably a fair criterion for similar institutions in this direction. Over a period of six years the diagnosis of primary carcinoma of the lung has been made twelve times. In this group eight were males and four females. Eight were of bronchogenic origin and two, alveolar-celled. The histologic returns are not available on the remaining two. Necropsies were performed upon eight of the series, and in two of this group the diagnosis was thus made for the first time. In one of these individuals a clinical diagnosis of tertiary syphilis had been made, while in the second the bilateral distribution of the primary carcinoma of the lung had proved misleading.

In analyzing the aids to the correct diagnosis in ten of twelve cases at the Wisconsin General Hospital, the clinical course and the physical findings were helpful in a majority. Biopsy of accessible nodes concluded the diagnosis after suspicion had been aroused in six of the ten positive antemortem diagnoses. A diagnosis by bronchoscopy was afforded in only one instance. Roentgenologic study gave the first clue in three subjects. Accordingly it may be concluded that no single factor in the diagnosis of primary carcinoma of the lung may be stressed to the exclusion of others. Only by attention to the details of the history and clinical course supported by every available measure of physical and laboratory diagnosis may a fair percentage of these cases be diagnosed antemortem. Considerable stress has been placed upon the utility of biopsy studies of accessible lymph nodes in clinching the diagnosis. Of course such implants represent metastases and in so far as therapy is concerned, a stage beyond recall of present measures of treatment. If eradication is to be effected, earlier diagnoses must be made; and the roentgenogram and bronchoscopic study offer the greatest promise in this direction.

OVERSUPPLY OF TRAINED NURSES

Training schools must curtail the steady production of more nurses or the morale of the nursing profession will break down completely. This is the opinion of the Committee on the Grading of Nursing Schools, following an analysis of early returns of the 1930 census on workers.

How serious the oversupply of graduate nurses has become is revealed by the Grading Committee after tabulating figures for eighteen states and the District of Columbia. For this group, since the 1929 census, the total population has increased 7 per cent, while the total number of trained nurses has increased 78 per cent.

Although there are still areas of the country and groups of patients not properly nursed, owing to poor distribution and lack of special training, the figures for the forty-two cities studied show that the average nurse has no more than 149 days of employment in any given year, according to the present sickness rate. In Bangor, Maine, she has not more than 77 days of work, and in Ottumwa, Iowa, where employment conditions are best among the cities studied, she can work not more than 201 days in the year. Rates for the other cities range between these two.

States as a whole are somewhat less oversupplied with nurses, although in New Hampshire the nurse can expect no more than 190 days of work in the year, and in Maine, Vermont, Iowa, North Dakota, South Dakota, Kansas, Delaware, Montana, Wyoming, Arizona, Nevada, Idaho and the District of Columbia there is not nearly enough nursing to be divided between the trained and untrained nurses competing for patients.

Untrained nurses are not on the increase, census figures show, but trained nurses are being turned out to terrific competition by the thousands each year. In Maine, for example, there was in 1900 one trained nurse for every 5,068 persons; in 1910, there was one for every 910; in 1920, one for every 579, and in 1930, one for every 349.

"If nursing is to avoid disaster," says Dr. May Ayres Burgess in presenting these figures in the March number of the *American Journal of Nursing,* "the steady production of more students, who become graduates, must cease. It must cease not only in the small schools, but in most of the large schools as well. Graduate nurses must be employed. If they are unemployable, they must be reëducated. The schools of nursing have produced them. They are members of the profession. Unless their morale is to break down completely, they must either be eliminated or utilized.

"This is a year of national economic distress. Hospitals are short of funds. How, then, can hospitals take care of their patients with reduced numbers of student nurses, with increased numbers of graduate nurses, and without increasing the annual budget? Let us not assume that there is no solution for this problem. Nurses who are intimately familiar with hospital administration may be able to discover new economies, new methods of organization, which will make reductions in the number of student nurses possible. Unless some solution can be found, which it is within the practical means of the hospital to adopt, nursing will continue to grow in numbers and in distress."—American Nurses Association.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Help the Veteran

When the World War Veteran first came home from the wars, the army itself was looking after his affairs. Also the United States Public Health Service, if he was disabled, and the Red Cross.

Before long, however, the army and the health service dropped out of the official picture and a brand new government bureau to be known as the Veterans' Bureau took their place. This bureau was to have charge of hospitalization of veterans still suffering from war disabilities. It was to rate them for purposes of disability compensation, to straighten out war risk insurance tangles and generally to administer, in the interest of the veterans, the growing volume of veterans' law. In the meantime the service men's organizations were growing up, the American Legion, the Disabled Veterans of the World War, the Veterans of Foreign Wars, all of whom established agencies to help the veteran to get his rights under the law. The Red Cross also went right on acting as a friendly intermediary for the ex-soldier.

In 1923, it was brought to the attention of the legislature of the state of Minnesota that in spite of all this organized overlapping system of veterans' aid, the veteran still needed help. Thus the Division of Soldier Welfare was established under the wing of the State Board of Control with a large enough yearly appropriation to set up an office and employ several persons, 80 per cent of whose time has been taken up in the past nine years in helping the veterans to get a fair hearing on compensation claims or to get needed hospitalization from the Veterans' Bureau.

All this in spite of the fact that it was the obvious intention of Congress in setting up the Veterans' Bureau that the bureau should give all necessary aid in securing the rights of ex-soldiers.

It is a foolhardy veteran, now, who submits any sort of claim to the bureau even for simple, routine hospitalization, who does not enlist the liaison officer of his service organization, or the Division of Soldier Welfare, or the Red Cross, or a Congressman, or all four, to help him.

It should not be said, either, that the situation is the fault of the many hard-working, wholly well-intentioned officials of the Veterans' Administration, itself.

But insofar as it affects needed hospitalization and medical care for men who are entitled to such care, it is a situation of real interest to physicians. One important consideration back of the confusion, attendant upon getting a man into a veterans' hospital, is lack of beds. In spite of millions already spent and millions more authorized for the purpose of building more government hospitals, there are not now and probably never will be enough beds in government hospitals.

The solution to the whole situation—and to the elimination of a great deal of wasted money and time—lies in the use of standard civilian hospitals near the home of the veteran for the acute illness and the emergency case. There are plenty of beds in good civilian hospitals where first class medical care is immediately avaialble. In fact these same civilian hospitals are facing a serious administrative and economic problem because of their heavy percentage of empty beds. No waiting and wire pulling ought to be necessary to secure for the acutely sick veteran the use of them.

Ramsey Prepares Its Resolution

Seven sub-committees of the Ramsey County Medical Veterans will undertake a thorough study of the veterans' hospitalization situation upon which a suitable resolution on the subject, for presentation to the American Legion, may be based.

Each committee will investigate one phase of the problem to be dealt with in the proposed resolution. It is obviously necessary to appeal to the veterans themselves, through their service organizations, on any proposal to improve this admittedly difficult situation. The Ramsey county organization is wisely getting its facts before it makes any proposal which is to stand the scrutiny of the officials of its local Legion Posts.

EDITORIAL

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THE STATE MEETING

Final arrangements are now under way for what is undoubtedly to be the most varied and colorful and universally interesting annual meeting of the Minnesota State Medical Association. This meeting is scheduled for May 23, 24, and 25 at the St. Paul Auditorium.

An entirely new program scheme by which no less than three important program sections and sometimes as many as fifteen or twenty sections will be held simultaneously, took shape at the third meeting of the 1932 Committee on Scientific Assembly held at the St. Paul Athletic Club Saturday, March 12.

The unusual interest displayed in advance by the membership of the Association was cited by members of the Committee as necessitating this year's enlarged program. It is to include separate medical and surgical sections; some forty small group table demonstrations; programmed motion pictures on a variety of subjects; and an afternoon of clinics. Program requests coming, more than ever before, from members outside the four large medical centers have chiefly dictated the structure of the program, which will be of especial use and appeal to the general practitioner. As a result, also, many more men than usual from the rural districts will read papers before the various sections of the program.

The total number of men appearing on all of the programs will exceed 120, the committee announced. Among these, besides a representative group of distinguished Minnesota physicians, are several interesting out-of-state speakers. Dr. Walter Sebening of Frankfort-on-the-Main, Germany, who has spent six months in America studying American surgical management of peptic ulcer, will appear on the surgical section of the program. Dr. W. C. Campbell, orthopedic surgeon of Memphis, Tenn., will address one of the noon general sections, as well as Dr. Theodore N. Davis of Greenville, S. C., and Dr. Ralph Major of Kansas City.

The scientific sessions begin with two conferences, one clinico-pathological and the other radiological, on Monday afternoon. They will deal principally with pulmonary tuberculosis and nontuberculous pulmonary disease.

The medical economics meeting is scheduled to unite the medical association and the Minnesota State Hospital Association, which is also convening at the Auditorium on the same date, in one large general meeting to be held in the Auditorium theater. The subject for discussion at this meeting will be "Medical and Hospital Care of Veterans," and a group of representative physicians, hospital men and laymen will talk on the various phases of the subject. Among the Monday night speakers already scheduled are Father Maurice Griffin of Cleveland, Ohio, Board of Trustees of the American Catholic Hospital Association; Dr. Olin West of Chicago, secretary of the American Medical Association; Mr. Frederic R. Bigelow of St. Paul, and Mr. E. V. Cliff of Ortonville, Executive Committee of the American Legion.

The Tuesday scientific program opens at 8 A. M. with simultaneous medical and surgical sessions, the surgical session occupying itself for a considerable part of the time with surgical aspects of obstetrics, and the medical section chiefly with cardiac disease, cardiac neurosis and a general consideration of the rôle played by quackery in the management of neuroses.

At 10 A. M. the entire membership will adjourn to the exhibit hall for the small group table demonstrations which are to occupy an entire hour on both Tuesday and Wednesday mornings. The subjects already definitely determined upon for these demonstrations include eyegrounds; ulcerative colitis; the physiological action of animal venom; the use of the artificial larynx; peripheral vascular disease; the photoelectrometer as applied to hemoglobin demonstration; the Friedman hormone test; Congo red test for amyloids; syphilis, practical points and therapy; trichomonas vaginalis; the tuberculin test; tularemia; varicose leg ulcers; typing for pneumococci; horseshoe kidney; lung abscess and lipiodol; foreign bodies and medical conditions in the esophagus; blood transfusion; undulant fever; primary tuberculosis in childhood (X-ray films); fresh pathology; cauterization of the cervix; audiometer; Schick test; blood; cholecystographic technic; surgical treatment by maggots.

A joint session of all sections will follow at 11 A. M on Monday, addressed by Dr. Campbell, on the subject of Fractures in and about the Neck of the Femur. Another joint session following lunch will be on the general subject of malignancy, with Dr. W. J. Mayo presiding. The medical section for the afternoon opening at 2:30 will include, among other varied subjects, a symposium on diseases of childhood. The surgical section for the afternoon will devote itself to different surgical problems involved in thyroid disease; intussusception in infants; tuberculosis of the kidney; cancer of the rectum.

The big social event of Tuesday night will be the annual banquet of the association to be held at the Lowry Hotel. Speakers for the affair will be Dean R. E. Scammon of the College of Medicine of the University of Minnesota, who will talk on "The Relation of the Medical School to the Man in Practice"; Rev. W. C. Sainsbury of Fargo, North Dakota, whose subject will be "The Family Doctor"; and Dr. M. S. Henderson of Rochester, president of the State Association.

Wednesday's scientific sessions will follow the Tuesday schedule with separate medical and surgical sections meeting until 10 A. M., followed by the table demonstration hour and the joint session terminating at 12.

A joint session of an hour will open the final Wednesday afternoon session followed by two and one-half hours of clinics, to be held also at the Auditorium meeting place.

The paper on peptic ulcer by Dr. Sebening to be read in the course of the morning surgical session will be a high light of the day, with two other headliners figuring at the joint sessions of the morning and afternoon programs. The latter will be the explanation by Dr. Davis of South Carolina of his method of prostate resection and also the discussion of hypertension by Dr. Ralph Major of Kansas City in the afternoon.

A special clinic in first aid has been arranged for Minnesota Highway Patrolmen for Wednesday afternoon, preceding the afternoon clinics, which are to include dermatology, neurology, cardiac, fracture, pediatric, and surgical clinics.

The separate medical section will devote itself to a variety of subjects, including recent developments in endocrinology; treatment of chronic arthritis with intravenous vaccines; and evaluation of the periodic medical examination.

A special program feature is to be made of the moving picture theater to be set up in the exhibit hall. A series of eleven films, some of them talking films, have already been secured. These will be shown at definite programmed times, the committee announces, and the program will be continuous. Among the films already booked are "Cancer of the Skin"; "Bone Tumors"; "Puerperal Infection," produced for Dr. D. H. Bessesen; "Preliminary Hemostasis in Goiter Surgery," produced for Dr. Martin Nordland; "The Tucking Operation for Strabismus," produced for Dr. Frank E. Burch; "Delivery of Twins," produced for Dr. J. J. Swendson; "The Gillette State Hospital for Crippled Children"; "Features in Hospital Administration"; "Repair of Urethrocele, Cystocele, and Lacerations of the Cervix"; "Repair of Second and Third Degree Lacerations of the Perineum and Rectocele." The committee announces that there will be time for a few more films besides these and invites association members to submit any others they may have for this showing.

An unusually large number of scientific and technical exhibitors have already taken space in the large ground floor exhibit hall in the fourth street ball room. Among them are the yearly increasing number of individual exhibitors competing for the gold medal annually offered for the best exhibit by an individual Minnesota physician by the Southern Minnesota Medical Association.

The tentative schedule for the business meetings provides for dinner meetings of the Council and the Reference Committees Sunday night, May 22, preceding the official opening of sessions. At 9 A. M. Monday the first meeting of the House of Delegates is scheduled, to be followed by a 12 o'clock luncheon meeting for this body on Tuesday, May 24. The Council is to meet again Monday noon, May 23, and at 2:30 P. M. Tuesday afternoon. Presentation of new officers will take place Wednesday morning, May 25.

Minnesota Alumni luncheon and fraternity luncheons are scheduled for Monday, Tuesday, and Wednesday noons. Arrangements for other social events, including the annual golf tournament, are pending.

The program of the Women's Auxiliary, which is holding its annual meeting, as usual, at the same time as the medical association, will concentrate this year on a series of round table discussions. These discussions, all relating to problems of public relations, will be led by Dr. O. E. Locken of Crookston, Dr. C. B. Wright of Minneapolis, and others. The annual Board meeting of the organization will be held Tuesday morning. Dr. Walter Alvarez of Rochester will be guest speaker at the annual Auxiliary luncheon, Wednesday, May 25. Dr. Alvarez' subject will be "Foods."

TRANSURETHRAL RESECTION

Of the various infirmities which beset the aging man, none is more distressing than that of prostatic obstruction. It has been said that one man in three will be afflicted with enlargement of the prostate gland. Fortunately, however, such enlargement will actually obstruct the urinary bladder in only a relatively small number of cases. Obstruction is dependent not so much on the size of the gland as the position the hypertrophied gland assumes in relation to the neck of the bladder. Thus only a relatively small portion of the gland may protrude into the outlet of the bladder or impinge on it so as to cause difficulty of urination. Secondary inflammation of the tissues surrounding the internal sphincter and prostatic portion of the urethra, followed by contraction at the neck of the bladder, is also a frequent factor in causing obstruction.

To give surgical relief for prostatic obstruction has always been a formidable procedure. A generation ago it was accompanied by a frightful rate of mortality, so that many of the victims preferred to suffer palliative catheterization or suprapubic drainage rather than take the risk of prostatectomy and its complications. With improvement in surgical methods, and particularly in preoperative and postoperative care, the rate of mortality has in recent years been greatly reduced. In spite of every precaution, however, prostatectomy is occasionally followed by complications such as persistent infection of the urinary tract, stricture of the prostatic portion of the urethra, incontinence, persistent suprapubic or perineal fistula, and rarely by re-formation of prostatic tissue. The economic factor is also a formidable feature of prostatectomy, since it requires hospitalization with both medical and nursing care over a period averaging eight or ten weeks. It is obvious, therefore, that any method which gave the slightest opportunity to circumvent so formidable a procedure would be seized by the physician and layman alike. It is only natural, then, that in recent months a procedure termed transurethral prostatic resection should have aroused widespread interest.

It has been the history of many therapeutic procedures that one step leads to another until a method is evolved which is widely applicable. Removal of obstructing portions of the prostate gland through the urethra has had such a career. Such removal began with the early, unsatisfactory attempts of Mercier and Bottinio. Later, this procedure was revived with the employment of the endoscopic approach by Goldschmidt, Young and Luys; then it was further developed, and its field was amplified by Caulk, and recently it was refined and broadcast through application of visualization by Stern, Davis, McCarthy and Bumpus. The method formerly called "the prostatic punch operation" has been more recently dignified by the urologist, so that it now bears the somewhat imposing term of "transurethral resection." In the hands of an experienced and skillful urologist, transurethral endoscopic resection undoubtedlv will prove to be an invaluable addition to methods of treating prostatic obstruction. Its many advantages, such as lowered mortality, comparative freedom from permanent complications, reduction in duration of hospitalization, and reduction in time of postoperative care and convalescence, are obvious. Its superiority in removing commissural obstruction resulting from contracture of the vesical neck, or that caused by enlargement of the median lobe of the prostate gland, is undoubted. Minor degrees of enlargement of the lateral lobes also should be regarded as amenable to such resection. There is much evidence, however, which tends to support the conservative surgeon in his contention that, with marked enlargement of the lateral and median lobes, the best permanent results can be obtained by prostatectomy. On the other hand, even in this group of cases, excellent results have been claimed by the enthusiastic endoscopist, so that time alone will have to decide. The chief argument against transurethral resection, with obstruction of lateral lobes, is the probability of recurring obstruction because of incomplete removal. The average interval of time before obstruction recurs has not as yet been determined in a large series of cases. Even so, repetition of transurethral resection is not a formidable procedure, and if the patient is free from urinary symptoms during an interval of several years, he would probably be willing to take the chance.

It is of considerable interest that the old-fashioned case, in which there is a huge, hypertrophied prostate gland, with distended bladder, is now seldom observed. Instead, the patient of today who seeks medical advice soon after onset of symptoms, usually has only 30 to 60 c.c. of residual urine, and on rectal examination the prostate gland is found to be only moderately enlarged. This earlier consultation is undoubtedly the direct result of numerous communications, written by members of the medical profession, which have appeared in both medical and lay journals in the last decade. In the majority of these cases, the condition is amenable to transurethral resection.

Transurethral resection has come to stay. Whether its field will be expanded to include every case of benign prostatic obstruction remains to be seen. It is obvious that the best results from endoscopic resection will be obtained only with skill and wide experience.

W. F. Braasch, M.D.

OCCUPATIONAL THERAPY IN MINNESOTA

A realization of the value of occupational therapy for those temporarily or permanently disabled by accident or disease was one of the few tangible good results of the World War. Interest in this form of reconstructive work has persisted to some extent during the post-war period in its application to every-day casualties, but the medical profession is not acquainted with the nature or extent of this activity in our own state.

Occupational therapy consists of work specially selected for the patient partially or totally incapacitated by accident or disease, to accelerate the individual's return to his vocation or when necessary the teaching of new trades. The various centers are not self-supporting, as the money realized on the sale of articles less the cost of materials is turned over to the worker. Thus the various therapeutic centers require some financial backing.

The economic value of this type of work is considerable. It hastens the return to economic independence and thus relieves the always heavy burden on charitable undertakings. The psychic effect on the patient is fully as important. These individuals are given work, which is an essential to happiness, and are able to be at least partially self-supporting. Their morale as well as that of the institution is thus enhanced. Patients as a rule are enrolled only on recommendation of the attending physician and the type of work is selected in coöperation with a trained supervisor. Physiotherapy is a valuable adjunct in many instances and should be available at each center.

The training is carried out, in the larger centers of population, at headquarters known as curative work shops, in the hospitals, and in the home. Games and entertainment in the form of reading are adjuncts in the hospitals particularly.

The type of cases enrolled includes those suffering from fractures, encephalitis, spastic paralysis, poliomyelitis, nerve injuries, congenital deformities, arthritis, heart disease, tuberculosis and mental trouble.

In the larger centers of population—Minneapolis, St. Paul, Duluth, St. Cloud, and Rochester, for instance—vocational centers have been in operation for a varying number of years. These are supported by different agencies.

In Minneapolis the Curative Work Shop is being supported by the Citizens Aid Society and the Minneapolis Foundation as a demonstration of the need for such a service. The shop is under the direction of the Visiting Nurse Association but is a project of the Junior Board of the Visiting Nurses Association and the Junior League of Minneapolis.

In St. Paul, a Curative Work Shop was established in 1928 as a private enterprise by its director, Miss Martha R. Eming, as a demonstration of its need. Over a hundred cripples have been enrolled. Efforts so far to interest charity organizations or those philanthropically inclined have been unavailing and financial assistance will be necessary if the work is to continue.

In Duluth an organization known as the Duluth Association for Physically Handicapped sponsors the work, which is carried on in St. Mary's and St. Luke's hospitals and among the home-bound.

Many of the state institutions for the insane and the county tuberculosis sanitaria have their units.

Occupational therapy is taught at schools, sanctioned by the American Medical Association, at Boston, Philadelphia, St. Louis, Northwestern University, and Milwaukee Downer College. Graduates are registered in the American Occupational Therapy Association, of which the Minnesota Association of Occupational Therapy is a component organization. The state branch holds quarterly meetings in different parts of the state for the purpose of promoting the work and keeping up professional standards.

We know of no more worthy constructive undertaking than this. The insurance companies might well become interested from the money standpoint. Each community should possess a center and furnish the necessary financial support. The physician is in a position to lend his coöperation.

VEGE-SEA AND ORO BRAND KELP SALT NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that "Vege-Sea" is stated by the Oakland Food Products Co., Oakland, Calif., to be dried and powdered kelp, while "Oro Brand Kelp Salt" is stated to be a flavored mixture of this kelp with ordinary salt. The marketing of dried kelp or of a mixture of kelp and salt does not present any originality, and hence there is no warrant for the sale of these preparations under coined names. The Council found "Vege-Sea" and "Oro Brand Kelp Salt" unacceptable for New and Non-official Remedies because they are marketed with claims that are unwarranted and misleading and because the recognition of proprietary names for these unoriginal preparations is not in the interest of rational therapy. (Jour. A. M. A., February 20, 1932, p. 640.)

MISCELLANEOUS

MOST GOVERNMENTS ARE INEFFICIENT OR CORRUPT—SOME ARE BOTH (Continued)*

Edward H. Ochsner, M.D.
Chicago, Illinois

The founders of our government subdivided it into three branches: the administrative, the legislative, and the judiciary. This was done on the theory that each had a distinct function to perform and that they would all act somewhat as checks and balances upon each other. This seemed logical at the time and undoubtedly has many advantages, but our founders did not and could not foresee one of its dangers and one of the abuses to which this division was to be put, namely, the practice of sidestepping duty and responsibility. One of the chief governmental in-and-outdoor sports today is "passing the buck," with an "open season" the year round.

In a project involving as many problems as Social Insurance does, all the branches of the government would be involved in its execution—the administrative in administering it, the legislative in enacting the necessary laws, and the judiciary in adjudicating them. Let us then examine briefly how the different branches have deported themselves in the more recent past. Let us start by examining just one typical administrative activity of both the federal and the state governments.

Individual members of the medical profession have repeatedly called attention to the great need of a careful study of all delinquents and criminals in our state and federal institutions in order to determine the mental and physical condition of each member of these two classes with a view to their rehabilitation and possible reclamation, and yet almost nothing has been accomplished along these lines by governmental agencies. Dr. Frank L. Rector who recently completed a survey under the auspices of the National Society for Penal Information on health and medical work in all state and federal prisons and adult reformatories, states unequivocally that in not one of these institutions is there a well-rounded balanced medical and health program. While some of them provide acceptable accommodation for the care of the acutely sick or injured, there is little or no provision for the rehabilitation of the physically handicapped so that they will be better equipped for earning an honest living after their discharge to civilian life.

Just one typical example. On the day Dr. Rector visited the Ohio State Penitentiary, there were four thousand four hundred seventy-five prisoners within its walls, of which one hundred fifty-six were hospitalized. There was but one physician on the staff, all other attendants at the hospital being prisoners. While the physician was nominally on a full time basis he was carrying on an outside private practice as his salary from the state was insufficient to meet his living expenses. What can one part-time physicians accomplish with that many patients, a large percentage of whom are physically handicapped, mentally abnormal and emotionally maladjusted? Ohio is a fair example. In most of the other penitentiaries and in the federal prisons, conditions are no better and in some even worse.

Now let us investigate some of the legislative problems. While nearly every legislative body contains some men of outstanding ability, the great majority of legislators have not the slightest conception of what is required of their position and blindly follow their party bosses, who are not generally known for their altruism, their patriotism, or a burning desire to promote the public welfare. One of the worst features of our legislative activities is the fact that a small, well-organized and insistent minority can usually get its measures enacted into law unless some other group is adversely affected by the proposed legislation and makes a counter-attack.

Another bad method of securing legislation is the system of trading. An interesting occurrence of this sort happened in the state of Illinois in 1923. About that time a Chicago mayor was disgracing not only his city and state but the nation by the slogan, "Hit King George on the Snoot." A free citizen from the corn lands of the state decided that he would like to be sent to the state legislature, took up the battle cry, had just one plank in his platform, namely to make the American language the official language of the state. He was elected. By use of extensive vote trading he secured the passage of the following:

OFFICIAL STATE LANGUAGE

An act establishing the American language as the official language of the State of Illinois (Approved June 19, 1923. L. 1923, p. 7). Preamble.

177 (American language). 1. Be it enacted by the people of the State of Illinois, represented in the General Assembly:

The official language of the State of Illinois shall be known hereafter as the "American" language.

So much for administrative and legislative inefficiency. The next article will take up the judiciary.

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[*] One of a series of articles appearing in state medical journals on various phases of socialized medicine.

AN UNUSUAL URINARY PARASITE OR CONTAMINATION

John M. Culligan, M.D., M.S., F.A.C.S., and
Bernice Medley
Saint Paul

During a routine urinalysis of a patient, organisms were seen which we had never observed before. The patient was a male, single, seventeen years of age, who consulted us for a condition which was related in no way to the urinary system, and he had no complaints referable to the genito-urinary tract.

The organisms were living. Their bodies were roughly the shape of an electric flat-iron with two spear-like flagellæ protruding from the pointed end of the bodies. Their size was very uniform, the bodies measuring roughly 100 microns in diameter, and the flagellæ about 75 microns in length. The flagellæ moved rhythmically, sometimes separately and again in unison. Occasionally the flagellæ would flex themselves until they lay against the body of the parasite. Twice the organism was seen to turn over completely.

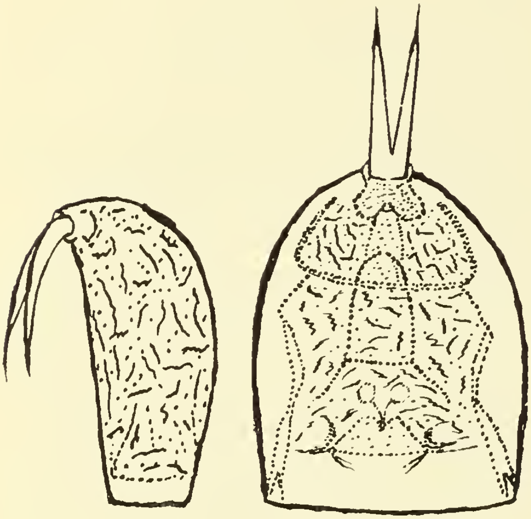

Fig. 1 *(left)*. Antero-posterior view of the parasite.
Fig. 2 *(right)*. Lateral view of the parasite showing the flagellæ flexed onto the body of the organism.

Their activity was marked at first but this gradually diminished, and after about ten minutes ceased entirely.

The parasites were finally identified as a rotifer of the Lecane type. They are notorious as contaminators and are found in stagnant water. Because of the possibility of contamination as a source, great care was taken in the collection of the specimen, using only new sterilized containers and laboratory equipment. In spite of this the organisms still persisted.

We are reporting these findings, realizing that they may still be a contamination, in spite of our efforts in avoiding it, and because we wish to know if any of our colleagues has observed the same phenomenon.

THE PREVENTION AND CONTROL OF VENEREAL DISEASES

A report of considerable interest recently submitted to Congress by Surgeon General H. S. Cumming deals with the prevention and control of the venereal diseases. During the fiscal year recently ended, the state health officers of 43 states reported to the Public Health Service slightly more than a quarter of a million cases of syphilis and more than 150,000 cases of gonorrhea. These diseases as a class continued to exceed the number of cases reported during the year of any other single communicable disease with the exception of measles.—U. S. P. H. S., March 11, 1932.

OF GENERAL INTEREST

Dr. A. B. Stuart, of Cloquet, Minnesota, addressed the Young Men's Forum of Cloquet Wednesday evening, March 9, on "The Menace of Medical Socialism."

Dr. Myron O. Henry, Minneapolis, talked before the Douglas County Medical Society at Superior, Wisconsin, March 2, 1932, on "Fractures of the Hip."

Dr. W. W. Duke of Kansas City, Missouri, addressed the Hennepin County Medical Society on "The Dawn of a New Specialty in Medicine—Allergy," Wednesday, March 2.

Dr. H. G. Irvine of Minneapolis was elected grand primarius of Alpha Kappa Kappa, national medical fraternity, at the concluding session of their three-day convention in New Orleans recently.

Dr. Ehrling L. Bergquist, son of Mr. and Mrs. E. L. Bergquist, Minneapolis, a graduate of the medical school of the University of Minnesota, class of 1929, and Miss Gertrude Babcock, daughter of Mr. and Mrs. M. Babcock, of Fairfield, Connecticut, were married at the home of the bride Saturday, March 5.

The 1932 Committee on Public Health Nursing for the State Association is to be headed by Dr. Harry Oerting, St. Paul. Other members are Dr. George Earl, St. Paul; Dr. C. B. Wright Minneapolis; Dr. H. I. Tregilgas, South St. Paul; Dr. W. H. Eude, Minneapolis; Dr. T. C. Flynn, Redwood Falls; and Dr. C. E. Caine, Morris.

Dr. Kenneth Bulkley is the new president of the Minneapolis Surgical Society elected at the Hennepin County Medical Society headquarters March 3. Other officers chosen are Dr. Martin Nordland, vice president; Dr. F. A. Olson, secretary-treasurer; Dr. R. C. Webb, council member for a five-year term, and Dr. E. A. Regnier, council member for a four-year term.

Hutchinson Community Hospital has been bequeathed $10,000 by L. A. Ritter as a trust fund, the net income from which is to be used for medical, surgical and nursing care for deserving persons who may from time to time be patients therein. Trustees of the funds are the Farmers and Merchants State Bank and the president of the hospital association.

Dr. and Mrs. J. F. McClendon and their sons, Stewart and John, Minneapolis, sailed March 24 on board the Asama Maru for the orient. Dr. and Mrs. McClendon and sons will make their home in Sendai, Japan, where Dr. McClendon will be associated with the Tohoku Imperial University as a visiting professor. Dr.

McClendon is a professor of physiology at the university.

April is the month chosen each year by the National Tuberculosis Association for its intensive campaign in the tuberculosis fight. This year its slogan is "Find the Other Case." A special pamphlet, "Where is the Other Case " has been prepared by the Association for physicians and is available upon request (without charge) at the Minnesota Public Health Association, 11 West Summit Ave., St. Paul.

Dr. Mario McC. Fischer, secretary of the St. Louis County Medical Society, is Duluth's new public health director, having been appointed, effective March 15, by the safety commissioner, Warren S. Moore. He succeeds Dr. L. A. Sukeforth, who resigned in December after eight years of service. Dr. Fischer will be employed full time. He is a graduate of the University of Minnesota medical school.

Contagious disease cases in the city of Duluth in the future will be cared for at St. Mary's and St. Luke's hospitals, and the municipal contagious hospital at Thirteenth Avenue west will be closed, under approval given by the city council at a weekly meeting held March 7. The council accepted the bids of the two hospitals to care for patients. The plan was recommended in a survey made by a government health director of that district.

"Pioneer Medicine in the Western Reserve," a book written and illustrated by Cleveland physicians, was published early in March by the Cleveland Academy of Science. The book relates in colorful detail the early medical history of Ohio. Among those who collaborated in the preparation of the book are Howard Dittrick, Frederick C. Wait, R. C. Rosenberger, J. Richey Horner, Edward Spease, Thomas J. Hill, Marion Noville Gibbons, J. P. Sawyers and Joseph T. Smith, Jr.

Sanction of the Council of the Minnesota State Medical Association was given at its last meeting for a survey of cancer statistics of Minnesota to be undertaken under the auspices of the American Society for the Control of Cancer. The committee of the state association appointed by Dr. M. S. Henderson to cooperate with the representatives of the cancer society includes Dr. H. E. Robertson, Rochester, chairman; Dr. Arthur Collins, Duluth; Dr. J. C. Litzenberg, Minneapolis; and Dr. John Rothrock, St. Paul.

The completed roster of members and officers of all the component societies of the Minnesota State Medical Association will appear in the May issue of Minnesota Medicine, after which time reprints will be available. This roster goes to every county attorney, every probate judge and most of the Insurance Companies in Minnesota for their use, identification and selection of medical service. Only those members whose dues have been paid and whose names have thus been forwarded to the state office before April 12, the publication date of the roster, will appear in this official list for 1932.

Dr. Leonard G. Rowntree, now director of clinical investigation of the Mayo Clinic, Rochester, Minnesota, and professor of medicine in the University of Minnesota, will head the new Philadelphia Institute of Medical Research, it has been announced.

The institute will center its activities in the Philadelphia General Hospital and will work with the various medical schools already established in the city. The new organization will be developed along the lines of the famous Pasteur Institute in Paris and the Rockefeller Institute for Medical Research in New York.

One hundred and twenty-five medical men, including staff members of the Charles T. Miller Hospital, were guests at a dinner given by the hospital in honor of Dr. John L. Rothrock Tuesday night, March 1, 1932.

Dr. Rothrock addressed the group on "Medical Progress in the Last Forty Years." Dr. Rothrock, famed as an obstetrician, has practiced in St. Paul for more than forty years. In December, 1931, he announced his intention of retiring, but he has been called on to continue his services and now expects to give up his practice gradually.

Dr. H. Kyuno, director of the Municipal Tuberculosis Sanatorium at Yokohama and a distinguished Japanese expert on tuberculosis, visited sanatoriums for treatment of the disease in and near the Twin Cities March 4, as part of a world tour on which he is studying such institutions.

As the guest of the Ramsey County Public Health Association, he visited Ancker Hospital and the Ramsey County Children's Preventorium in St. Paul.

He also inspected the Lymanhurst School for Tubercular Children in Minneapolis and Glen Lake Sanatorium at Oak Terrace before leaving for Chicago Friday night. He will sail from New York soon and expects to return to Yokohama in August.

The University of Minnesota, Carleton College and St. Olaf College share the wave length of 1,250 kilocycles with the commercial station WRHM. The three educational studios together use twenty hours a week and WRHM 104 hours. WRHM has petitioned the Federal Radio Commission at Washington to give them the entire time on this wave length. As a countermove the three educational institutions, claiming that the two commercial stations, WCCO and KSTP, furnish all the commercial broadcasting necessary in this area, have now petitioned the Federal Radio Commission to give the three colleges the entire time on this wave length. As radio listeners know, WRHM carries obnoxious advertising such as invitations for free medical examinations, and the medical profession of Minnesota is requested to write the Federal Radio Commission, Washington, D. C., protesting any curtailment of the use of 1,250 kilocycles by the educational institutions mentioned.

Dr. L. R. Critchfield, 1932 chairman of the Public Health Education Committee, reported on the scope of the work of his committee and on its program for the year at the regular February meeting of the Committee Chairmen of the State Association held Monday, February 29, at the Minnesota Union, University of Minnesota.

In the absence of Dr. M. S. Henderson, Rochester, president of the Association, Dr. E. A. Meyerding, St. Paul, Secretary, presided. Dr. C. B. Wright, Minneapolis, reported on the sessions devoted to the discussion of hospitalization and medical care of veterans held in connection with the Congress on Medical Education and Licensure in Chicago. The following chairmen and officers were present: Dr. Critchfield, Dr. W. H. Hengstler, Dr. John H. Armstrong, Dr. Leo Rigler, Dr. J. A. Watson, Dr. Gilbert J. Thomas, Dr. T. H. Sweetser, Dr. N. O. Pearce, Dr. S. R. Maxeiner, Dr. Wright and Dr. Meyerding.

Dr. and Mrs. J. A. Watson, Minneapolis, and their son, James Watson, Jr., will sail April 5 for a trip abroad. They will land at Naples, Italy, where their daughter, Miss Elinor Watson, who is studying music at the University of Munich, will meet them. Dr. and Mrs. Cecil J. Watson, son and daughter-in-law of Dr. and Mrs. Watson, may also meet the travelers in Naples. Dr. Cecil Watson is doing research work at Munich as a fellow from the national research council of Washington.

Munich will be the headquarters of the party and they will take short side trips to Vienna, Budapest and other cities following their drive northward from Naples to Munich. Dr. and Mrs. Watson and James, Jr., will visit in France and Switzerland before going to England, where they will visit another son, Mr. Leland Watson, a Rhodes scholar at Oxford university. They will visit in Ireland before returning to the United States about the middle of June.

COÖPERATIVE CLINIC TOURS

Arrangements have been made by the various State Medical Journals with the Amerop Travel Service for members to obtain at a very reasonable figure Clinic Tours to Europe this summer. The Centennial Anniversary meeting of the British Medical Association affords a special attraction this year. Clinics by outstanding members of the profession in Europe are being arranged in many of the principal cities of Europe, which include London, Paris, Vienna, and Berlin.

The steamers chosen are the palatial Bremen and Europa of the North German Lloyd Line and the best hotels will be used for those travelling first class.

Tour 1.—Leaves New York on the Bremen June 7, arriving at Cherbourg June 12. Thence to Paris, Berne, Lucerne, Zurich, Munich, Vienna, Prague, Dresden, Leipzig, Berlin, Amsterdam, The Hague, London, leaving Southampton July 29 on the Europa and arriving in New York August 3. Price first class $1,215; tourist $894.

Tour 2.—Leaves New York on the Europa July 19, arriving at Southampton July 24, thence to London, The Hague, etc., reversing the route of Tour 1, sailing from Cherbourg September 2 and arriving at New York September 7. Price: first class $1,095; tourist $774.

Tour 3.—Leaves New York on the Europa July 19. Only London and Paris clinics arranged for, with return to New York August 12 on the Bremen. Price: first class $760; tourist $365.

A deposit of $50 is required for reservation with return in full upon notification at least four weeks prior to sailing. Checks may be sent to the office of MINNESOTA MEDICINE or direct to Amerop Travel Service, 132 North LaSalle St., Chicago.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

FORMER NATUROPATH PLEADS GUILTY TO PRACTICING HEALING

State of Minnesota *vs.* Mitchell Jurdy

"Dr." Mitchell Jurdy, listed in the 1931 Minneapolis City Directory as a Naturopathic Physician, entered a plea of guilty to practicing healing without a Basic Science Certificate, on February 19, 1932, before the Hon. Frank E. Reed, Judge of the District Court at Minneapolis. Judge Reed sentenced Jurdy to a term of one year in the Minneapolis City Workhouse and stayed the sentence for one year pending the good behavior of the defendant and his compliance with the Medical Laws of this State.

Jurdy formerly maintained an office at Seventh and Hennepin in the City of Minneapolis and later practiced in his home at 3104 Portland Avenue. The present charge against Jurdy is based upon the alleged treatment of one Ruth Kleopfert, who, it was claimed, had been suffering for some time from epilepsy. Mr. Kleopfert, father of the patient, testified that they met the defendant at the Riley Long Life Health Club where Jurdy lectured. On the date of his sentence Jurdy told the representative of the Minnesota State Board of Medical Examiners that he has severed all connections with the Naturopathic Organization. The defendant is a young man about 28 years of age, married and the father of one child, his home formerly being in the State of Idaho.

DULUTH HEART "SPECIALIST" PAYS ONE HUNDRED AND FIFTY DOLLARS FINE

State of Minnesota *vs.* Hansen.

Harry A. Hansen entered a plea of guilty to practicing healing without a Basic Science Certificate on March 9, 1932, before Judge Edwin J. Kenny of the District Court in Duluth. After admonishing the defendant to comply with the Medical Laws of this State and informing him that a second violation of these laws would result in a straight Work-farm sentence without the opportunity to pay a fine, Judge Kenny imposed a fine of $150, which the defendant paid.

Hansen is 58 years of age and for the past four years has been doing business at 1906 West Superior St., Duluth, as the maker of "Master Medicines." He has been specializing in the treatment of heart ailments, tuberculosis, ulcers of the stomach and rheumatism. Prior to that time he was located at Ashland, Wisconsin, where he did similar work. The investigation also discloses that at one time he was an extra man on the Ashland Police Department. Hansen informed a representative of the State Board of Medical Examiners that he had the only cure in the world for tuberculosis which he was selling for $3.00 per two ounce bottle. People would go to Hansen's office where he would discuss with them their symptoms and he would then recommend his preparations. He charged $5.00 per two ounce bottle for his heart medicine. Hansen claims to have no medical education nor has he studied pharmacology except that obtained from reading books in his office. He claims to have his knowledge bestowed upon him in answer to a prayer.

DULUTH QUACK SENTENCED TO WORK-FARM

On March 4, 1932, John F. Kroeten, 48 years of age, entered a plea of guilty to practicing healing without a Basic Science Certificate before the Honorable Edwin J. Kenny, Judge of the District Court at Duluth. Judge Kenny sentenced the defendant to serve three months on the St. Louis County Work-farm. The Court refused to suspend the sentence and as a result thereof Kroeten must spend the next three months on the St. Louis County Work-farm.

Kroeten is an itinerant quack who has attempted to practice healing in St. Paul, Minneapolis and Eau Claire, Wisconsin, without the "formality" of obtaining a license. He is a carpenter and painter by occupation. He claims to have obtained his knowledge in the healing arts from other members of his family. Kroeten was arrested February 24, on complaint of the State Board of Medical Examiners, and was confined to the County Jail until March 4, because of his inability to furnish $500 bail. Some of the ailments Kroeten claimed to be able to cure were varicose veins, running sores, blood poison, rheumatism and "cancer on the outside."

This is the first prosecution for violation of the Medical Laws in St. Louis County in the past year and the Court by imposing a straight Work-farm sentence has made it very plain that quackery will not be tolerated in that County. Splendid coöperation was also received in this case from Harry E. Boyle, County Attorney, T. J. Naylor, his assistant, and the Police Department of the City of Duluth.

THE ADMINISTRATION OF SUPRARENAL CORTICAL EXTRACTS

The efficacy of replacement therapy in cases of Addison's disease by the injection of suitably prepared extracts of the suprarenal cortex, freed as far as possible from the epinephrine liberated by the medulla of the gland, has apparently been established. For patients that tolerate intramuscular injection well, this is, perhaps, the preferable method of administration. The intravenous method is indicated when the patient is in crisis and an immediate response is necessary. The possibility of effective oral administration has recently been reported on. In cases in which prolonged treatment is demanded, the oral route may be of preferential utility. (Jour. A. M. A., January 2, 1932, p. 52.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of April will be as follows:

April 6—Personal Hygiene—Rest and Sleep.
April 13—Leg Cramps.
April 20—When Pneumonia Begins.
April 27—Spinal Cord Tumors.

AMERICAN PROCTOLOGIC SOCIETY

The thirty-third annual meeting of the American Proctologic Society will be held in Memphis, Tennessee, on Friday and Saturday, May 6 and 7, 1932. Headquarters will be at the Hotel Peabody. The program includes clinics, and scientific papers. All interested members of state medical associations upon the payment of the usual fee of $5.00 are eligible to attend the session which has been arranged to convene immediately preceding the A. M. A. meeting at New Orleans, May 11.

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

CAMP RELEASE MEDICAL AUXILIARY

Mrs. R. C. Adams, Bird Island, president of Camp Release Medical Auxiliary, announces the following appointments of Public Health Chairmen for the Camp Release district: Renville County, Mrs. A. A. Passer, Olivia; Yellow Medicine County, Mrs. J. Kilbride, Canby; Chippewa County, Mrs. L. G. Smith, Montevideo; Lac Qui Parle County, Mrs. Nels Westby, Madison.

RAMSEY COUNTY

At the regular meeting of the Ramsey County Auxiliary at the home of Mrs. K. C. Wold, January 25, a silver cup was awarded to Robert Laurason of Harding High School for the best paper on "Cause and Prevention of Tuberculosis." Mr. Paul Fesler gave an interesting talk on the "Hospitalization of Veterans of the World War."

On February 12 a party was given at the Ramsey County House for the inmates. From the progressive card party also held during February, a substantial sum was realized to be used toward the Student Loan Fund.

HENNEPIN COUNTY

The February meeting of the Hennepin County Auxiliary was held Wednesday, February 24, in the Society rooms, where a program inspired by the Washington centennial was greatly enjoyed.

At the annual meeting and election of officers of the auxiliary held March 23, at 10:00 A. M., in the Nicollet Hotel, Minneapolis, the following officers were elected:

President, Mrs. Hugh Tunstead; president-eleet, Mrs. F. A. Erb; first vice president, Mrs. Emil Geist; second vice president, Mrs. Moses Barron; recording secretary, Mrs. G. T. Nordin; corresponding secretary, Mrs. H. B. Sweetser, Jr.; treasurer, Mrs. George G. Eitel; auditor, Mrs. Glenn Matchan; custodian, Mrs. H. W. Quist.

A class for the study of international relations has been organized under the very able leadership of Mrs. Walter Marcley. This class is open, without charge, to any members who care to attend the meetings.

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

SYMPOSIUM ON FRACTURES

Conducted Jointly with the Minneapolis Regional Sub-Committee of the General Fracture Committee of the American College of Surgeons
Meeting of Wednesday, February 3, 1932
Auditorium of the Medical Arts Building, Minneapolis
Dr. J. Frank Corbett, Presiding

Dr. J. Frank Corbett: As President of the Minneapolis Surgical Society, I have been requested to call this meeting to order. After a few general statements have been made the conduct of the meeting will be turned over to Dr. Kenneth Bulkley, Chairman of the Minneapolis Regional Sub-Committee of the General Fracture Committee of the American College of Surgeons.

There has been a tendency in this locality for general surgeons to neglect fracture treatment, possibly because of the lure of abdominal surgery. This is not true to so great an extent in other places, as the work of Scudder, Speed, Stimson, Blake, Ashurst, Bohler and other general surgeons in recent times demonstrate. The early fundamental principles of bone repair and of fracture treatment were largely in the hand of general surgeons; notably with Murphy, Senn, Parks, MacEwen, Ashurst, Cheyne, and Burghard, Lister, Brandenheuer, Trendelenberg, Bunger, Dawbam, Handley, Freeman, Konig, Lane, Langenbeck, McBurney, and Cotton. More recently the diligence in publishing and the scientific efforts of Robert Jones, Albee, Whitman, Hibbs have made the impression that fractures were an orthopedic problem.

It is manifestly impossible that all fractures could be treated by the relatively few orthopedic men available. This problem is still a duty of the general surgeon. The purpose of this meeting is to make general surgeons fracture minded. It is hoped that the general surgeon will see that he ought not to neglect this field. This entails interest in the subject, careful study, and the solution of problems that are still unsolved. The field is enormous and can not be discussed in a few minutes except in a general way. This will be gone into in more detail by those who follow me. Unless treatment is manifest and some fruits of this interest are developed, the treatment of fractures will pass from the realm of the general surgeon.

Dr. Kenneth Bulkley.—In 1912 the American College of Surgeons was incorporated; in 1913 it emerged from its swaddling clothes and since then has rapidly progressed to young manhood. Among its major achievements the most prominent unquestionably has been its work in the betterment of hospitals through its Hospital Standardization Committee. More recently it has turned its attention to another fertile field—namely the betterment of the care of fractures. In order to carry on this work it appointed what is known as the General Fracture Committee of the American College of Surgeons. This Committee, realizing that it could not carry out its program of improvement in the treatment of fractures, both from the education of the undergraduate and of the graduate, organized in the larger centers of population in this country Regional Sub-Committees to assist it in carrying on this work. My old friend Dr. Charles L. Scudder of Boston, with whose classic book on fractures you are all familiar, is chairman of the General Fracture Committee of the College. Failing in his usual good judgment, he appointed me Chairman of the Minneapolis Regional Sub-Committee on fractures. I have asked to serve with me on this committee one representative of each of the accredited hospitals in Minneapolis and have added to this group a number of other surgeons who for want of better appellation might be termed free lances. Our meeting tonight and our meetings tomorrow are the first fruits of the efforts of this Minneapolis Committee.

We are fortunate in having here in the Twin Cities a member of the General Fracture Committee of the College. The last meeting of the General Committee was held in Chicago in January, 1932, and I take great pleasure in introducing Dr. Roscoe C. Webb, our local member of that General Committee, who will report to us in brief the proceedings of this last meeting.

Dr. R. C. Webb.—The Committee on the Treatment of Fractures of the American College of Surgeons was established by the Regents of the College to promote interest and general improvement in this increasingly important branch of surgery. The great advances in the standardization of the other branches of surgery during the past forty years have so interested surgical teachers that until recently the teaching of fractures has suffered. The sad story of fractures is being constantly related before our industrial commissions, when the victim is so fortunate as to have had his accident while employed, and the permanent disability ratings granted and the computations of costs in money make up a large portion of the commission's reports.

The American College of Surgeons' Year Book contains the reports of the Committee on the Treatment of Fractures and you have no doubt noticed that the fundamentals such as the teaching of fractures in medical schools, the minimal equipment for hospitals, accepted treatments for certain common fractures, the organization of regional sub-committees, and similar subjects have been included in these reports. The Committee functions through annual meetings of the Committee, through sub-committees, and through regional sub-committees.

The annual meeting of the General Fracture Committee of the American College of Surgeons was held early in January of this year in Chicago at the College of Surgeons building. The meeting was similar to our meeting now being held, in that it covered two days and consisted of reports of committees combined with clinics at the University of Chicago by Dr. Phemister and at the Presbyterian Hospital by Dr. Speed.

The Committee on Bone Plates and Screws reported the completion of their work for the present. Surgeons in various parts of the country had reported catastrophes resulting from the breaking of bone plates. Investigation showed that these were due to inferior material in the plates. This committee, in conjunction with the United States Bureau of Standards, has provided standards for manufacturers and certified plates and screws are now on the market.

The Committee on Medical Education in Fractures gave the results of one of the recent questionnaires to medical schools and described the teaching in one of the larger eastern medical schools. In the first year the students receive four hours in instruction on fractures, two hours when the work of dissection on the upper extremity is completed consisting of demonstration of prepared specimens with classical fractures with discussion of the surgical anatomy and the structures which may be injured, followed by illustrations with X-rays and clinical cases. A second similar two hours is given on completion of the dissection of the lower extremity.

In the second year a similar four hours are again given in connection with the studies in anatomy. Also in the second year twenty hours are devoted to fracture healing and pathology in connection with the course in pathology supported by experimental work and clinical cases.

In the third year the students are advised to secure the A. M. A. Primer on Fractures and are given the American College of Surgeons' Outline on Treatment of Fractures. Thirty-seven hours of instruction in fractures are given to small groups in the out-patient department and there are seven hours of instruction in the care of bed fractures.

In the fourth year there are fifteen hours of instruction on the wards in the bed treatment of fractures. In addition surgical clerks spend a few nights in the hospital to see the handling of acute fractures and an attending surgeon is required to come to the hospital for each case for the purpose of teaching initial diagnosis and treatment.

The Committee on Contact With the National Board of Medical Examiners reported that questions on fractures will be included in the examinations in surgery.

Ambulance equipment was also discussed and recommendations were made. It is probable that the ideal here will not be reached until all internes riding ambulances are thoroughly versed in the anatomical structures surrounding the fractures as well as the pathology, and will as a result become first-aid-minded, so to speak.

Physiotherapy was discussed and the opinion was expressed that early physiotherapy should be further developed.

Regional committees were reported upon and their further development was urged.

One session was devoted to work on revision of the Outline of the Treatment of Fractures which was published last spring. It is hoped that this volume can be published in an improved form in the near future.

The Committee on the Treatment of Fractures is now in the tenth year of its existence. The Minneapolis Surgical Society is now beginning its second decade. The coöperation of this society should insure much constructive work by the local region sub-committee in the care of fractures generally in this vicinity.

THE TEACHING OF FRACTURES IN THE MEDICAL SCHOOL CURRICULUM

Dr. Owen H. Wangensteen

The impetus lent to surgery by its three greatest benefactors—anesthesia, asepsis and the Roentgen rays— have widened tremendously the borders and increased the scope of surgery. These agents have likewise been a great boon to the better and more intelligent handling of fractures. Everywhere, however, one hears echoed the criticism that fracture treatment has not exhibited the uniform improvement long since manifest in many newer chapters of wound management. Many who are qualified to know and have given the matter serious study say that fractures on the whole are badly managed.

Amongst other causes, one naturally seeks an explanation of this existing state of affairs in the curriculum of the medical school where the future practitioner establishes his first contact with the conduct of fracture cases. If one were to direct his inquiry concerning the teaching of fractures to the deans of our medical schools or subordinate officials more directly responsible for this subject, he probably would receive a fairly uniform type of answer. They would probably be the first to own that fractures like most other subjects in the curriculum do not receive the attention that the importance of the subject justifies. In event the interrogation came when the deans and their curriculum committees were brooding over contemplated increases in allotment of time to any of the divisions (a no small part of the Deans' worries) and the utter futility of adjusting the curriculum to everyone's complete satisfaction was quite apparent, the apology concerning the inadequacy of instruction in fractures might be qualified to this extent: The chief office of the medical school is to equip the student with weapons with which he may intelligently approach his future problems. Medical training is a life-long process of education in which the young graduate has made only a start. The Medical School believes that if it has taught its students how to think that it has served its purpose well. We have sought to stimulate their interest and arouse their curiosity but not to satisfy it. We have not made finished artisans out of our students but we have furnished each with tools with which through constant effort he may become practised in their use.

The advent of cellular pathology which has contributed in such large measure to our better understanding of disease processes has stimulated a great interest in normal as well as pathological microscopic anatomy with a consequent lessening of intensity of interest in applied anatomy. Our predecessors who were called upon to reduce fractures without the aid of anesthetics were far better schooled in the knowledge of muscle antagonists than we. They were intimately concerned with the art of obtaining relaxation of the muscles responsible for the deformity. Though anesthesia has modified the problem greatly, I am persuaded that a good grounding in applied anatomy is just as essential today in the management of fractures. A knowledge of the mode and extent of muscle pull contributes definitely to a better understanding of the occurrence of fractures through the most frequent agency of indirect violence.

Zuppinger went to the anatomical laboratory in Zürich to investigate the force necessary to break the tibia by twisting. The laboratory "diener" informed him that he had taken over a very difficult task. It was found that four men could not break the tibia in this manner even though the foot was twisted off at the ankle joint. Sir Astley Cooper relates that when Damien was executed for the attempt to murder Louis XV, four horses were fixed to his legs and arms, and repeated ineffectual forced attempts for over fifty minutes were made to tear his limbs from the body. In order to effect this dismemberment and extinguish the doomed man's life, the executioners were obliged to cut the muscles and the ligaments near the trunk. The agency of muscle pull determines in large measure the facility with which fractures are seen to occur. Dislocations and fractures are more readily sustained in life than after death.

At the University of Minnesota two formal required courses in fracture instruction are given; one is an objective course of eleven sessions, each of an hour and a half in length in which cases are shown demonstrating the particular varieties of fractures under discussion. This course is given to the juniors, one division of the junior class being present each quarter. Two of the eleven weeks of the surgical clerkship offered to seniors is spent solely on fractures. Both these courses are given under Dr. Zirold's supervision at the Minneapolis General Hospital where an abundant fracture material is available and he is here to speak more in detail about the nature of this instruction.

Fracture instruction is also imparted, though in a lesser degree, in the courses of applied surgical anatomy, principles of surgery, regional surgery (orientation course), lectures on orthopedic surgery, the weekly clinics to juniors and seniors, the surgical Out-Patient Clinic, and in ward walks with the surgical clerks by the hospital staff.

There exists a large mass of knowledge concerning fractures, but one can not escape the impression that this information is not as well crystallized as that in other spheres of the surgeon's activity. The fundamentals of fracture treatment, viz., reduction, fixation, and assurance of good function need more emphasis. He who essays to treat fractures must learn to be the master of a method and not the slave of apparatus. Patients are not infrequently admitted to the hospital some days after the occurrence of a fracture with the note that the proper splint or apparatus was not available for handling it.

A stimulation of interest in fractures will undoubtedly contribute more to their management than any other combination of factors. With an increased field of activity has come a lessened interest in fractures and a tendency on the part of accomplished surgeons to turn this time-consuming group of cases over to their less experienced associates. Surgery is not a province with fixed boundaries. With advances in knowledge, some diseases once dealt with almost solely by operation are found to respond better to more conservative means of treatment, while others for similar reasons are surrendered by the internist to the surgeon. That which is essentially mechanical, however, has always remained surgical. Wound surgery, of which fractures constitute an essential part, has ever been the surgeon's domain. Whether fractures will remain a field of activity for the general surgeon or be taken over in large measure by reprisal by the industrial or orthopedic surgeon, the general surgeon's interest will chiefly determine.

Fractures constitute so great a portion of the injuries and accidents that it is highly important that a large number of well qualified individuals be prepared to deal with this important branch of surgery. The general practitioner has always been an important agent in the caring for fractures and his interest in an improved fracture program must be enlisted. In the care of those fractures in which the responsibility is great he should be counselled to seek skilled aid in their management from the start.

The recent graduate casting about for a field in which to divert his interest and equip himself by special training in surgery is not likely at present to become enthusiastic over fractures. He knows that the care of fractures demands constant attention and eternal vigilance and that the rewards of his labors in terms of hours spent is not great. He knows that his liability to a charge of malpractise is much greater in external injuries than when dealing with obscure internal complaints. Though mindful of the correlation between anatomical restoration and function, he sees juries placing undue emphasis upon the X-ray film. He hears of cases not settled on their merit but by debate in which physicians express seriously conflicting opinions over matters in which he sees little room for disagreement. He notes that unprincipled colleagues and unscrupulous lawyers will for a fee distort facts and confuse issues that lead to a decision in which he sees no justice, and may even prove his undoing.

Possibly these are some of the evils that must be patiently tolerated temporarily but which will in the end clear some of the barriers and bring about the reform that must take place before young men will lend themselves wholeheartedly and without prejudice to this important chapter of surgery.

FRACTURE TEACHING AND ORGANIZATION AT THE MINNEAPOLIS GENERAL HOSPITAL

Dr. A. A. Zierold

The Minneapolis General Hospital has approximately 768 beds available for the service of charity patients. Of this, the surgical service comprises about 150 beds. Some fifty to ninety beds of these are usually given over to fracture cases. This constitutes a separate and distinct division of the surgical service and is administered and staffed as such. In the receiving wards there are fourteen to fifteen beds for such patients as require a short period of observation, but whose condition does not demand admission to the surgical wards. Added to this, the daily out-patient service admits the ambulatory cases for after treatment and physiotherapy.

The staff consists of a chief and three associates which change every three months. Of the attending staff one man is assigned to the fracture service and he and the chief constitute the senior staff of the service. It will be necessary to go a bit more into detail concerning the fellowship teaching and staff. We have, at present, five teaching fellows on the surgical service. At the end of six months we expect to have six. These are residents of the surgical service and are appointed for a period of three years. During the first six months of their residence, they are assigned to general surgical service with the duties of a first assistant and the responsibilities of the care of surgical patients. The second six months period is spent on the fracture service both in the hospital ward and in the out-patient department. During the third six months, the assignment comprises the orthopedic service and the receiving service combined. The fourth six months is made up of a similar receiving service combined with urology. At the beginning of his third year, the teaching fellow occupies the position of junior resident and is allowed to do minor surgery and such supervised operating as lies within his capacity as determined by the attending surgeon. During the last six months the teaching fellow as senior resident is permitted to do independent operating and to have the care of such cases as may be determined by the attending staff. During this last year the junior and senior residents act as advisors and supervisors of the men who are their juniors.

The interne organization as applied to surgery is composed of four men on a rotating service. Two of these men are assigned to fractures, and together with these two is another interne who is on a straight surgical service and who remains for six months on fractures and six months on general surgery.

The receiving service is staffed by one of the senior fellows and one of the senior residents who has passed through his general surgical service and through his fracture service, and who has at his disposal the attending staff man assigned to the service at that time.

The out-patient service up to recently has been cared for by teaching fellows, internes, and an assigned staff man. This will probably be changed with reorganizations of the dispensary and the out-patient staff. The department of physiotherapy is in the charge of a full time physiotherapist who cares for the patients within the hospital and such out-patients as require treatment.

Briefly, the fracture service is a distinct division staffed by the chief, associates, senior and junior fellows, and junior and senior internes.

The teaching of fractures to the students is undertaken both by lecture and by clinical demonstration. There are weekly lectures of one and one-half hour each in which bone injury, repair, methods of treatment of typical regional fractures, complications, and results are considered. These lectures are supplemented by individual case record, X-ray examination, and exhibition of illustrative cases. If the patient cannot be moved, the students are taken to the wards to inspect the case, its progress, and the manner of treatment. Following the completion of the assigned course of lectures, the student is assigned to a clinical clerkship devoted solely to fractures. This occurs during the senior year. During the time of a student's assignment, he is required to take case histories, make physical examinations, and observe and record the progress and treatment of his cases. Each day the student group is met by a staff man and some particular phase of fractures is taken up in the form of a clinical demonstration. Fractures are seen, too, by the student in the receiving ward and emergency calls are responded to as in other clerkships. Although no organized course of physiotherapy is given, an attempt is made to have the students observe the various forms and applications of physiotherapy. The surgical service and particularly the fracture service has been in a state of flux from out of which is gradually crystallizing a definite organization. I feel that it would only be fitting at this time to express a most heartfelt appreciation for the work of Dr. Charles Remy as superintendent of the Minneapolis General Hospital. By reason of his understanding and capacity for organization and accomplishment, not only the physical equipment of the hospital, but the morale of the personnel is at a higher point than ever before. This has been supplemented by the coöperation of Dr. Wangensteen who has afforded us a generous number of teaching fellows of most excellent quality.

Dr. Emil S. Geist discussed "The Minimal Requirements of the Average Hospital For the Care of Fractures," with the following conclusions:

A. Fractures can be, and have been, well taken care of with extremely meager physical equipment, if the surgeon possesses brains, training, ingenuity, and mechanical fitness.

B. The most luxurious mechanical contrivance will not itself cure a fracture; it must be under the constant and intelligent control of the surgeon or of the orthopedic surgeon.

AMBULANCE EQUIPMENT AND PERSONNEL

Dr. Edward T. Evans

My assignment, "The Equipment Necessary for the First-aid Treatment of Fractures," assumes, I suppose, that I should speak of physical equipment.

I prefer to go further back in the treatment of our largest single industrial and machine-age accident result.

The old-fashioned bone setter treated many serious fractures as well and often better than some of us. They, at least, had instinct and mechanical sense on their side.

My contention is that all the physical equipment in the armamentarium of the most renounced fracture man is useless in the hands of a recent graduate or interne or country practitioner or general surgeon, unless he has that fundamental mechanical sense which tells him how to utilize it. And our specialists become dangerous when their armamentarium directs their method of treatment.

We have assembled here during these few days, not to improve ourselves alone, but to shape future policies with regard to fracture care in this district with the hope that we may mould others into the same line of thought. That means teaching,—a thankless task. Of course we have our brilliant student who follows our lead, who looks up to us and adopts our ways (perhaps that is why we think him particularly brilliant); but the average student is not so. Him we must so teach and direct that he develop a mechanical sense, a fundamental anatomical and functional understanding, and a stick-to-it-iveness that will follow his fracture through from the first aid to recovery. And we must instil in him the realization that sometimes his physical and mental equipment is insufficient and he must realize when he is over his head and should call for assistance.

I regret that my work leads me to the above conclusion. Not in a spirit of criticism but rather in an attitude of facing the facts and trying to drive home this thesis, I cite the following:

The first fracture I saw in this city was a subtrochanteric fracture treated first in a poorly fitting plaster spica by a man who could not use plaster (the first lesson a fracture interne should learn and it takes at least a month of daily plaster work to do so); then by skin traction which was inadequate at four weeks when it was applied. Open reduction was done the day following the removal of skin traction—in the presence of blisters. The patient died of osteomyelitis and amyloid degeneration after months of suffering.

I recently saw a traction of forty pounds applied to a Steinman pin in the os calcis for an old fractured shaft of the femur with two and one-half inches overriding. Luckily the pin broke before the ankle and knee ligaments. The patient now has Kirschner pin traction through the femoral condyles with satisfactory reduction.

A fracture of the surgical neck of the humerus recently came under my observation. The fracture is beautifully reduced but the patient has lost two-thirds of her elbow motion from a Steinman pin insertion in the olecranon process.

A fracture at the base of the neck of the femur in a man of thirty-eight is now under my care with three and one-half inches over-riding and non-union because the spica was removed at seven weeks. The reduction was perfect, but the plaster had to be removed because a check-up X-ray showed the fracture had slipped in the plaster. Need I comment on that plaster?

A week ago I reduced an old Colles' fracture with terrific deformity which occurred in a man with a fracture of the neck of the femur. The Colles' fracture was not recognized. The neck of the femur was treated in a short leg spica, to above the knee!

These are extreme cases I admit, but as I look back over them I know that they were avoidable if we, as teachers, and this includes you older men who taught us younger ones, administer first-aid in the class room, the anatomy laboratory, the clinics, and then on the street and accident floor where the physical first-aid of the fracture commences.

What then are these physical agents for use in the first-aid treatment of fractures? Let me enumerate them briefly.

1. The fracture conscious interne.
2. Stretcher.
3. Warm blankets.
4. Tourniquet.
5. Sterile dressings and elastic bandages.
6. Four triangular muslin slings.
7. Four muslin bandages four inches wide.
8. Thomas ring splint for leg.
9. Thomas ring splint for arm.
10. Large soft pillows.
11. Basswood boards 30 × 4 × ¼ inches.
12. Safety pins.

Of all the above the Thomas splint is by far the most important and most useful, the use of which every interne should thoroughly understand. In an attempt to impart some conception of its usefulness, Dr. Wallace Cole devoted two full periods of senior lectures to this subject alone.

Do's:

1. Treat shock by keeping the patient warm and stopping hemorrhage, preferably by compression bandages.

2. Use the tourniquet without hesitation if necessary.

3. "Splint them where they lie" without moving them about.

4. Use the Thomas ring splint for all fractures above the middle third of the lower leg and above the mid-shaft of the humerus, using the wide muslin for applying traction as a double sliding loop.

5. Use the pillow and basswood boards applied as a box splint for the lower leg and ankle fractures.
6. Use a double triangle sling for elbow and lower arm fractures.

Don't:

1. Hurry.
2. Be rough.
3. Forget your tourniquet.
4. Forget your fundamental anatomy and physiology.

I plead for mental equipment, applied anatomy, applied common sense, applied follow-up and teaching in our hospitals by those who, by instinct and training, love fracture work and can so carry it out that it will prove an inspiration to our students, be they undergraduate or post-graduate like ourselves.

Dr. Myron O. Henry presented the subject of "Treatment of Fractures of the Vertebræ," with the following conclusions:

1. Any back injury may be a fracture, therefore X-rays are of paramount importance.
2. Those with back injuries should be transported face downward.
3. Deformity in crushed fractures of the vertebræ can and should be reduced as in other fractures.
4. In cases of fracture of the spine with complete paralysis, laminectomy *may* be indicated in the cervical region, is *usually* indicated in the dorsal region, and is *always* indicated in the lumbar region.
5. Most orthopedic surgeons are agreed that fusion operation offers relief in cases of long standing pain and disability after a compression fracture of the body of the vertebræ.

COLLES' FRACTURE

Dr. George R. Dunn

Colles' fracture, a fracture of the lower end of the radius, is frequently associated with a fracture of the styloid of the ulna, tearing of the ligaments of the wrist between the radius and ulna and faulty position of the radius and ulna at the lower radio-ulnar joint, and poor position of the ulna.

Reduction may be accomplished by any one of the several well known manipulations. X-rays after reduction should show that the angle between the articular surface of the radius and the shaft of the ulna forms an angle of 90° or less. Position may be maintained by anterior posterior moulded splints for about four weeks and in most cases careful movement may be commenced in about ten days under the direction of the surgeon. X-rays should be taken before and after reduction, before removing the splint and before resuming full time work. Reduction is usually indicated.

Conditions which may lead to impairment of function are: (1) conditions of the radial joint surface at the radio-carpal joint, especially irregularity; (2) the inclination of the joint surface at the lower end of the radius (normally 75-80° with the long axis of the radius); (3) position of the lower radial fragment; (4) position of the lower end of the ulna; (5) the condition of the radio-ulnar joint; (6) the amount of ligamentous damage and fracture of the styloid of the ulna.

Fifty cases of Colles' fracture treated by forty-eight different medical men which had been examined and X-rayed were reviewed and tabulated. The table shows:

1. The average disability was 14 per cent in hand and wrist.
2. In 74 per cent of cases the articular surface of the radius and the long axis of the radius formed an angle of over 90° (imperfect reduction).
3. In 26 per cent the angle was 90° or less (good reduction).
4. No disability in 24 per cent.
5. The fracture line involved the radio-carpal articulation in 46 per cent with an average disability of 16 per cent (about average).
6. In 8 per cent the radio-carpal joint surface was rough with an average disability of 20 per cent.
7. In 14 per cent, with about an average disability, the radio-ulnar articulation was not good.
8. In 24 per cent the angle between the radial articular surface and the long axis of the radius was distinctly bad (110-125°), and these cases averaged 22 per cent disability.
9. In 26 per cent of the cases, the angle was 90-75° and these averaged 5 per cent disability.

CONCLUSIONS

1. Colles' fractures are not being efficiently reduced.
2. A good reduction, 90° or less, will average about 5 per cent disability.
3. Poor reduction, angle of 110-125°, will average about a 22 per cent disability.
4. An uneven radio-carpal articulation frequently leads to a high disability, but the mere fact that the fracture involves the joint does not give a poor prognosis.
5. Fracture of the styloid plays little part in the disability except in an occasional case.
6. The position of the ulna, the condition of the lower ulnar articulation and ligamentous injury, all should be given attention but are not the most important factors in determining the ultimate result.

FRACTURES OF THE NECK OF THE FEMUR

Dr. O. W. Yoerg

Fracture of the neck of the femur may occur at any age, but it is essentially one of adult life. It constitutes about one-third of all fractures in persons passed 70.

The weakest part of the femur is the neck. The head receives its blood supply through the ligamentum teres and by circulation in the cancellated structure of the bone. In advanced years the vessels in the ligament practically disappear and the head of the bone must depend almost entirely for its blood supply from the spongy tissue of the neck. It is this lessened blood supply with a rarification of the bone due to advancing age that makes this fracture possible, and so often prevents union from taking place.

We are all familiar with the classical symptoms of a fractured hip. It must be remembered however, that a person may fracture a hip and still be able to walk about. It is always advisable in any injury of the hip in patients past middle life to have X-rays made, preferably sterescopic films. A thorough study of the films must be made, as even on excellent films a line of fracture can easily be overlooked. If a fracture does occur and has not been recognized, and the patient is allowed to be about, a breaking down of the fracture may occur and a definite deformity result.

Probably the most satisfactory method of treatment that we have today is the abduction treatment devised by Whitman. It is true that many fractures do not unite even with this method, but it is generally recognized as the method of choice at the present time, and it has been adopted by the fracture committee of the American College of Surgeons after much discussion and study.

X-rays should be made after reduction and application of the spica cast, and should be followed by further X-rays to check the position of the bones. Frequently the patient looses weight and the cast does not fit snugly, and at the end of four to six weeks a film will disclose absorption of the neck with a marked coxa vara. When this occurs the cast must be removed and other treatment instituted.

The abduction spica cast fixation should be used in most cases of fracture of the femur. It should be used in practically all of the young and middle aged, where the bones are impacted with deformity and where they are unimpacted. It may be used in many of the aged, but will require much care and nursing to avoid complications. Sound judgment should always prevail. An old person alive, even if disabled, may bring much happiness to his children and grandchildren, whereas his passing at the expense of a good surgical result, will bring only sorrow.

CARPAL INJURIES

Dr. Richard R. Cranmer

The most frequent injuries to the carpal bones are anterior dislocation of the semilunar, usually without but frequently with fracture, fracture of the body of the scaphoid and row-on-row dislocation. Dislocation of the semilunar bone can easily be missed unless a lateral X-ray view is taken.

Recent dislocation can be reduced by manipulation under the fluoroscope by hyperextension and then gradual flexion while traction is being exerted on the hand and pressure used over the dislocated bone.

Older cases (three days to a week) usually require volar incision and, after the bone is palpable, the same manipulation as described above.

Some few cases in which the volar ligament is torn, and especially if fracture is present, are best treated by excision of the bone.

Fracture of the body of the scaphoid is the most frequent injury in the carpal region and is best treated by approximation of the fragments if there be any malposition, and the application of a dorsal plaster splint from the base of the fingers to the elbow joint so applied as to hold the hand in slight dorsiflexion and slight ulnar abduction. This should be worn for at least six to eight weeks. Old cases with some absorption of the bone should also be so treated, but the splint should remain on for from four to eight months.

If approximation of fragments is impossible, the proximal fragment should be removed.

The usual mechanism of scaphoid fracture is strain having been applied with the hand in hyperextension or acute flexion. The two carpal rows flex on each other but the scaphoid, being so placed as to interfere with the transverse midcarpal joint line, bears the brunt of the force and breaks.

Row-on-row dislocation can be reduced, in most cases, under proper anesthesia and with adequate traction. Excision of a row of carpals, which has been advocated by some, seems too radical a procedure for this condition.

MEETINGS OF THURSDAY, FEBRUARY 4, 1932

On Thursday, February 4, 1932, Dr. Kellogg Speed, Professor of Clinical Surgery at Rush Medical College, Chicago, was the guest of the Minneapolis Surgical Society.

At 10 o'clock in the morning Dr. Speed conducted Fracture Ward Bounds at the Minneapolis General Hospital. At that time he discussed in detail cases presented to him by the Staff of the hospital. The discussion of each individual case was made in connection with X-rays taken before, during, and after treatment. He commented on the treatment and gave his ideas as to the latest principles of treatment in the individual case. This two-hour period proved to be most fruitful.

At 2 o'clock P. M. Dr. Speed addressed the medical students of the University of Minnesota in the Anatomy Amphitheater. Although the address was primarily for the medical school many visiting physicians attended. His address was on "Unhappy End Results in the Treatment of Fractures." In the course of this discussion he showed numerous X-rays of fractures both before and after treatment. His discussion brought out vividly the errors and mistakes which contribute to unfortunate end results. His talk could well have been entitled the "dos and don'ts" in fracture surgery. It was of more than usual value to medical students and to physicians.

At 6:30 o'clock P. M. the Annual Formal Banquet of the Minneapolis Surgical Society was held in the Nicollet Hotel. Dr. Speed was the guest speaker, and following the banquet, addressed the Society on the subject of "Fractures of the Neck of the Femur."

FRACTURES OF THE NECK OF THE FEMUR

Dr. Kellogg Speed

The subject of my talk tonight is something about the problems encountered in the treatment of fractures of the neck of the femur. You have probably all read the papers by Hey-Groves and Whitman given in London in 1929, covering the subject of fracture of the neck of the femur; and if one has followed Whitman's work on the subject, he is inclined to feel that the last word has been said.

My message to you tonight is to stir up the subject and to see what your reaction is to it. There is possibly something deeper in the study of fractures of the neck of the femur than the mere exercise of the Whitman method of extension, inversion and abduction, and it is these additional points we must study.

The points I wish to make are two: (1) that the conservation of the natural blood supply of the head of the femur must be maintained to hurry any bony healing that is to take place, (2) that the reëstablishment of the old line or a new line of weight bearing trabeculæ in the neck of the femur must be obtained so that the whole limb will function; it being assumed that a first class reduction and proper position has been made and held by a suitable plaster dressing for a sufficient length of time. The time required for full bony union varies from six to twelve months and is aided by exercises of the limb and by judicious use, but not by injudicious weight bearing. If there is too much and too early weight bearing it jeopardizes the situation and may act untowardly. The final results will give bony union with retained blood supply in the head, no absorption of bone and strong weight bearing trabeculæ, but the question is when will it give it; and that is what I want to stir up interest in.

You know there are three or four sources of blood supply in the neck of the femur. These are the blood vessels from the diaphysis, from the epiphyseal arteries, from the periosteum and from or through the ligamentum teres. The blood vessels from the diaphysis of the femur come from the superior nutrient artery. It gives branches that may cross over the epiphyseal plane and enter the head of the bone. Second, the epiphyseal blood vessels enter the head in two directions and the periosteal supply is the richest of all.

These lantern slides show by a graphic method the blood supply of the head of the femur and the periosteal blood vessels in a rather massed group penetrating and passing up toward the head. If one takes a specially injected specimen from the cadaver one finds some of these diaphyseal vessels passing across the epiphysis into the neck and head of the bone, giving a rather rich blood supply in the head as a whole.

In the Whitman method of reduction of fracture of the neck of the femur the limbs must first be considered as lying parallel. The injured limb is drawn down until it is equal in length to the uninjured limb. The sound limb is abducted to its limit and the injured limb is then abducted until the two angles made by the legs with the body are equal and until the length of the legs is absolutely equivalent. After inversion of the femur reduction is accomplished. It is frequently necessary to lift up the femur on the injured side because it drops backward away from the head. The muscles will not allow movement of the thigh. The patient is put in plaster. I saw very excellent examples of this at the Minneapolis General Hospital. No one can do it any better. Whether to use a double or single spica is for you to decide for yourself. The patient's wants can be taken care of, bed sores can be avoided by frequent turning in this rigid plaster and he is quite comfortable.

Factors that help an effort at bony union in the neck of the femur as in any bone are immobilization and rest, proper food and other physiological elements which include some irritation, but not weight bearing which will break down the maturing trabeculæ.

This slide shows a case of fracture of the neck of the femur which was rayed within a few minutes after the fracture. In the roentgenogram lies much of the interpretation of the fracture, and the exact requirements of the reduction, *i.e.,* what you want to do. The patient is put to sleep and the bone is put in position and you look forward to a reasonably happy outcome. You may or may not get a good result.

Six weeks later, while the patient is still in plaster, you should re-ray the fracture to study the decrease in density of the head as compared with the opposite head. Any X-ray shadow of the skeleton is dependent on the amount of calcium in the bone because the principal shadow-making material is the calcium salts. You study the head to see whether its density varies as compared to surrounding osseous structures. This film was taken six and one-half weeks after fracture and it looks as if the head is viable because, had it died, it would have become necrotic and it would retain the density as of the day it died and throw a shadow much darker, surrounding bone having lost calcium from atrophy of disuse.

Turning to the mechanical side of fracture in healing after the break is reduced and the head remains alive, the trabeculæ develop and after a given number of months, 6, 8, or 12, with judicious use, the trabeculæ finally line up and we have a head of equal density with the trochanteric portion. We then know we can depend on the union when the patient starts to walk.

This film is of a man 58 years old who fell down and broke the neck of his femur. Within an hour and a half after fracture I put him into plaster. This is six months later as it appears on X-ray examination. It looks to me as if the density of that head were very satisfactory. Here, one month later, the trabeculæ line up again. This is another month later, and the result looks very happy. Here it is four years later. The density of the head seems to me equivalent to the other; that head looks viable to all tests of the X-ray, and the patient is walking about and going to his business.

Some cases do not act that way. Probably the blood supply of the head remained in this instance but some of these fractures later unite and develop pain, lameness and possibly additional shortening. The causes of this are:

1. Insufficient period of immobilization.
2. Too early weight bearing, usually without the help of the caliper.

Other minor causes are:

1. Excessive body weight.
2. Condition of the vascular system.
3. Impaired myocardial action.
4. Poor nourishment.
5. Endocrine disturbances.

These fractures are not confined to older people, but fractures of the neck of the femur occur in children. These pictures are of a young boy with epiphyseal separation. This epiphysis was separated when the boy was wrestling with an older person and I made this reduction. It looks to me as if it were fairly satisfactory. He was kept in plaster sixteen weeks, and was then put in a caliper for four and one-half months. About a year and a half later he was sent away to military school and was subjected to serious over-training, over-walking, etc., as a part of the discipline to which he must conform. He came back in two years with a limp. I found when I came to X-ray it that there was an irregular shaped head and thickening angulation in the neck. He had pain. Immediately he was taken out of school and in spite of my best efforts this head went on to further destruction. Three months later, on X-ray examination of the head we found it was flattened, spread out, and light spots of bony replacement existed in it. Six months later, although he wore a caliper there is still some dark area in the head. No doubt that head is undergoing absorption and breaking up into fragments. Nine months later, in spite of wearing the caliper there is flattening, a change of configuration, and a little narrowing of the head portion. This is a graphic story of that case for four and a half years.

The next picture is taken eight years after the fracture through the epiphysis and we see that the neck is thickening; there is some new bone formation around the trochanter. The boy is in school but can't play football and can't engage in sports. There may still be dead unreplaced bone in that head. He had all the attention that the surgeon could give him.

It is difficult to get autopsy specimens of fracture of the neck of the femur and in twenty years' endeavor I have not had very many. This photograph is an impacted fracture of the neck of the femur occurring simultaneously with a fracture of the shaft. The shaft fracture has healed; it has abundant firm callus. The head of the femur, however, is not very firmly attached. The cartilage looks pretty good. On the whole, the head looks reasonably viable and yet after four and a half months the neck does not seem very well healed. On cutting through the specimen here is the healed shaft fracture; the medullary cavity is filled with callus. It looks well united. But the neck and head look different and there is no strong union, no rearrangement of the trabeculæ. We X-rayed that head, and in this picture we see the head with its density in the central portion largely that as of the day of injury. Here are some old trabeculæ; here is new bone formation, or at least invasion of bone. The main part of the head is dead; there doesn't seem to be a real bony union. The fracture plane is not thoroughly united; there is a lot of replaced bone, representing nearly a half or a third of the head. The fracture plane and head present an aseptic necrosis back from the fracture edge.

Another specimen recovered 6 and one-half to seven months after fracture, at which time the patient died, shows that the head has undergone some replacement; the cartilage does not show very distinctly. This replacement has not built itself into the firm trabeculæ that could stand wear and tear.

Shall a head showing areas of dead bone be removed or be used in a scheme of treatment which contemplates its complete final replacement and ossification? What I want to bring before you is a study of the bone that will help us in prognosis and treatment.

When we come to the treatment of ununited fractures we have to consider:

1. Direct treatment of the fracture, body plaster of Paris, after extension, inversion and abduction of the leg even if the head is dead.
2. Active treatment for
    a. Incipient ununited fracture.
    b. Established ununited fracture.
    c. Separation of fragments or true nonunion.

Our mainstay of help in these cases is the walking caliper, which is the best friend we have while waiting for these changes to go on.

Is there not something more in fractures of the neck of the femur than sheer mechanical apposition? Is there something more than reducing it under the Whitman maneuver? We must admit, however, that this method of treatment is perhaps the best yet devised, but we must prolong our investigation of the progress of these cases and there should be checking X-ray control during the course of encasement in plaster and after the patient is removed from the dressing. If ununited fracture with failure in trabecular alignment develops or the head shows evidence of aseptic death a prolonged freedom from weight bearing must be indicated. My purpose then is to stimulate you into further study of your fracture cases looking towards the betterment of treatment in general and of this particular type especially.

The banquet was well attended and there were many out-of-town guests.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of January 13, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 13, 1932. Dinner was served at 7 o'clock, and the meeting was called to order by the President, Dr. J. S. Gilfillan at 8 o'clock. There were 57 members present.

Minutes of the December meeting were read and approved.

Annual reports of the Secretary-Treasurer were read and approved.

The Academy voted to offer, through the Board of Regents, an annual prize of $100.00 for the best piece of original research work of an undergraduate student of the University of Minnesota; the prize to be awarded by a committee selected by the Dean of the Medical Sciences, one member of which committee shall be a member of the Minnesota Academy of Medicine.

The President appointed a committee to draw up resolutions on the death of Dr. H. Longstreet Taylor, who died January 2, 1932.

Upon ballot, Dr. C. N. Hensel of St. Paul and Dr. F. H. K. Schaaf of Minneapolis were elected to Active membership in the Academy.

Dr. Gilfillan then called the President-elect, Dr. J. C. Litzenberg, of Minneapolis, to the chair.

Dr. Litzenberg: I would be ungrateful indeed if I did not seize this occasion to voice my grateful appreciation of the honor you have shown me by electing me President of this Academy. Honors may be real or not, as the occasions indicate, but when one is elected to preside over a society of the character of the Minnesota Academy of Medicine by his intimate colleagues who know his faults, it is an honor indeed.

I am now pleased to introduce to you the retiring President, Dr. Gilfillan, who will give his President's Address on "Compulsory Sickness Insurance."

Dr. J. S. Gilfillan (St. Paul) then read his Address, to appear in Minnesota Medicine at a later date.

DISCUSSION

Dr. E. L. Gardner (Minneapolis): Is it coming here?

Dr. Gilfillan: I think quite surely within not too long a time it is going to come up for consideration. Of course the United States is different from Europe. Very likely it will come up in the states. Social insurance has already gone quite a ways in the United States; we see that in various lodges, industrial plants, etc. All these social insurance instances are predecessors of compulsory insurance, but I think it will be a long time before it is universally applied in this country. It will come up for discussion at least, but whether or not it will be accepted I don't know. The American Dental Association has investigated this quite thoroughly; they have raised funds and sent representatives to Europe to study the various systems over there, and they are quite ready for it. The medical profession should get in on it so that they will have something to say about the framing of the laws and the administration of the scheme. In Germany it is probably more unsatisfactory than in any other country but of course Germany is very poor anyway and one can't apply that to the United States. I am quite sure that we will see the thing brought up and I think we should be prepared for it.

Dr. H. B. Zimmermann (St. Paul): In those countries in which the scheme is apparently quite satisfactory to the doctors, isn't that due entirely to their loyalty?

Dr. Gilfillan: It is due mostly to the organization, which has gotten in early enough. Another thing that helps a lot is the number of doctors. Norway, for instance, has one doctor to 1,900 population; so there it is easier to make it satisfactory than it would be in the United States where there is one doctor to every 750 of population. The total income per capita is less if there are two or three doctors to support in place of one.

Dr. C. B. Wright (Minneapolis): This is an exceedingly interesting and timely paper. I regret that Dr. Gilfillan did not have time to discuss the condition of the hospitals in these various countries. In Scotland, according to the best information I could get, the panel doctors are not permitted to do anything but the simplest emergency surgery. Cases needing operations and hospital care are sent to public hospitals. The staffs of these hospitals do the necessary work without compensation. In Sweden and Norway I have been told the hospitals are under the control of the state and the men are employed full time, in most cases receiving very small salaries. In fact at one time the medical association had to raise a large sum of money to support doctors who would refuse salaries below a certain point. In England the only income the surgeons get from private patients is where the patient is operated on in the surgeons' nursing home.

In this country, if the present method of building hospitals to give free hospital and medical care to veterans of all wars is continued, we will have much the same situation as far as hospitals are concerned. The Veterans' Administration has recently outlined a policy calling for the building of over 100,000 hospital beds in addition to the some 42,000 beds which they now control.

Dr. Gilfillan: In Sweden there is no compulsory insurance but there the medical society is pretty tight and also the number of doctors is quite low, about 1 to 2,800. Doctors are stronger when not too numerous. Sweden is under a voluntary system; but in Sweden the doctor himself cannot make a contract without the consent of the organization.

Dr. A. E. Wilcox (Minneapolis): You spoke of Lloyd George as being the man who put over the system in England, and the act becoming a law before the doctors knew anything about it. From what source did the plan originate?

Dr. Gilfillan: In the first place a lay committee was appointed. But Lloyd George was really the man who put it over with the representatives of the insurance companies. The insurance companies had the scheme all framed before the doctors knew anything about it.

Dr. R. E. Scammon (Minneapolis): It seems to me that the problem here presented is the one that we are always facing with regard to insurance and pensions. Everywhere we are trying to get too much for too small a contribution on the part of the insured. I once had occasion to take up an insurance plan with the President of a University and received a typical answer. He said, "There are two objections to your plan: first, it costs too much, and second, you are not providing large enough pensions." In practically all insurance plans we do not collect enough money and therefore we take it out of the profession; later somebody has to suffer.

I would like to emphasize also the point Dr. Gilfillan brought out about the number of practitioners, 750 individuals per practitioner in the United States. Last year I had occasion to figure out how fast practitioners were increasing. I discovered that they are increasing five times as fast as the population is growing, and that for every four men who were graduated from our institutions, one from a foreign institution is admitted to practice.

Dr. Litzenberg: In 1918, in my address as President of the Hennepin County Medical Society, I warned the medical profession that the socialization of medicine was surely coming and the degree to which it comes would depend upon the control of it by the medical profession, by studying the situation, and, as Dr. Gilfillan has indicated in his talk, by the profession taking control and have it governed by the profession and not have it forced upon us by lay agencies.

The meeting adjourned.

R. T. LaVake, M.D., *Secretary.*

PROCEEDINGS OF THE MINNESOTA SURGICAL SOCIETY

Meeting of October 23, 1931

The October meeting of the Minnesota Surgical Society was held in the Todd Memorial Amphitheater of the University Hospitals on Friday afternoon, October 23, 1931.

The meeting was called to order at 2:15 by Dr. Owen H. Wangensteen. The meeting was turned over to Dr. O. J. Campbell, who presided over the following scientific program:

"Tuberculous Empyema," a paper by Thomas J. Kinsella, M.D., F.A.C.S., and E. P. K. Fenger, M.D., Glen Lake Sanatorium, Oak Terrace, Minnesota, was presented by Dr. Kinsella.

Tuberculous empyema may develop in one of four general ways: (1) as a late development from a primary pleural effusion; (2) as a result of dense pleuritic involvement during or subsequent to a tuberculous pneumonia, oftentimes mistaken for a non-tuberculous empyema complicating pneumonia and treated accordingly; (3) as a complication during the course of artificial pneumothorax induced in the treatment of pulmonary tuberculosis; (4) from the spontaneous rupture of a tuberculous abscess or cavity into the pleural space either with or without a preceding pneumothorax. This latter type is almost always complicated by secondary infection. The first two of these are not seen frequently and are not usually recognized as tuberculous in origin, and are treated as non-tuberculous empyema, and a true diagnosis is not made until persistent draining sinuses call attention to a possible tuberculous background, or microscopic examination of tissue or guinea pig inoculation of the secretion eventually tells the true story.

In tuberculosis work, the type of tuberculous empyema most frequently encountered is that which develops during the course of artificial pneumothorax for treatment of pulmonary tuberculosis. Here, because of tuberculous involvement of an area on the visceral pleura, an effusion develops, usually clear at first with a low cell count, gradually or suddenly increasing in severity and amount until a purulent fluid is formed. The development of such a process may be gradual and silent, or sudden and stormy with fever, rapid pulse, chilliness, general malaise, etc., usually interpreted by the patient as an attack of grippe. Fluid soon appears in the pleural cavity discovered either by physical or fluoroscopic examination, or by the presence of splashing which the patient hears or feels. The purulent effusion represents a later stage or a more intense reaction of the same process which produces the clear pleural fluid. The fluid itself may vary all the way from a slightly cloudy or smoky fluid with a cell count of a few thousand to a very thick greenish or yellowish pus with cell count ranging from many thousand to several hundred thousand or more, depending upon the intensity of reaction and the time the fluid has remained in the pleural cavity. Tubercle bacilli may be easily demonstrated on smear in some fluids, while in others they can be found only with difficulty or by means of guinea pig inoculation. The patient, after the first reaction to the formation of the effusion, may have few or no symptoms aside from the weight and the splash of the fluid, but may feel toxic as long as pus is present.

Tuberculous empyema developing subsequent to spontaneous rupture of a tuberculous abscess or cavity into the free pleural space is almost always accompanied by sharp reaction, both from the sudden shock and embarrassment which follows the sudden collapse of the lung and from the marked inflammation which follows the massive contamination of the pleura with tubercle bacilli and secondary organisms. Fever, constitutional symptoms and prostration rapidly follow and the patient becomes very ill within a short time after its onset. The bronchial fistula may remain open, may close promptly, or may develop a check-valve action preventing the escape of air forced into the pleural cavity during paroxysms of cough, and by the positive pressure maintained greatly embarrass the patient mechanically by pressure upon the heart, mediastinum and diaphragm, or displacement of these structures.

In the treatment of tuberculous empyema without secondary infection or without artificial pneumothorax, three points are of prime importance: (1) evacuation of the pus; (2) obliteration of the pleural space; and (3) the avoidance of secondary infection. Open drainage by rib resection or catheter must never be used in this group of patients, for to do so will not only interfere with expansion of the lung and obliteration of the pleural cavity, but will allow the entrance of secondary infection, which must be avoided. Prolonged suppuration from any source is followed by degenerative changes of a lardaceous type in various organs. For this reason, we advise frequent removal of the purulent secretion from the pleural pocket through a needle and the washing of the pleural cavity with sterile saline, being careful always before withdrawing the needle to be certain that it contains no pus to contaminate the needle tract. A wide variety of antiseptics have been used but have gradually been discarded in favor of normal salt solution. If the lung is extensively collapsed at the time the empyema develops, it should be re-expanded so that it is at least half way out to the chest wall before it becomes bound down in order to facilitate subsequent obliteration of the pleural space. If the underlying disease in the lung itself has healed sufficiently to permit complete-expansion of the lung, then this should be done without delay for the final healing of a tuberculous empyema is dependent upon the complete obliteration of the pleural space. A few empyemas, after a period of aspiration with partial reexpansion of the lung, subside and do not recur. Others subside but recur at a later date, weeks or months later. If the patient's general condition and the disease process in the contralateral lung will permit and the lung cannot be expanded to meet the chest wall, the final solution to the difficulty is complete obliteration of the pleural space by extrapleural thoracoplasty, bringing the chest wall down to meet the partially expanded lung, with aspiration of all air and fluid. Complete obliteration of the pleural cavity can be proven by repeated physical and X-ray examination over a period of months or even years, supplemented by attempted aspiration of any suspicious area. Residual pockets, unrecognized, will eventually drain themselves as the tension increases either by perforation of the lung with drainage through a bronchus or by perforation of the chest wall. If, after maximum collapse has been obtained by a complete thoracoplasty, posterior plus anterolateral, an empyema pocket still remains, its roof should be totally removed, leaving no overhanging edges, and the pocket packed with gauze and allowed to heal by granulation.

Tuberculous empyema with secondary infection without bronchial fistulæ may be sterilized by the use of dyes, of Dakin's solution, or other antiseptics, and treated along the same lines as the uncomplicated tuberculous empyema. Tuberculous empyema with secondary infection with bronchial fistulæ is probably best treated by preliminary open drainage first, by catheter if the patient is desperately ill, later by rib resection placed as far laterally as possible so that it will not subsequently interfere with posterior thoracoplasty. With free drainage, sterilization is then attempted, being extremely careful to prevent entrance of any irritating antiseptic into the bronchial fistula. The lung is allowed to expand as much as it will. At a subsequent date, when the patient's general condition and the condition of the contralateral lung will permit, the pleural cavity is to be obliterated by a complete radical extrapleural thoracoplasty to be followed if necessary by an unroofing of any uncollapsed pocket.

DISCUSSION

Dr. O. H. Wangensteen (Minneapolis) felt that Dr. Kinsella had stressed very well effectual obliteration of the pleural cavity as an important element in achieving success in tuberculous empyema. But in general hospital practice perhaps the type of tuberculous empyema more frequently seen is that type in which there is no manifest evidence of tuberculosis present. Within recent months Dr. Wangensteen had observed two cases of this sort and he had been somewhat chagrined when he thought he had cured the patient of the pyogenic infection to find later on that the patient also had tuberculosis. The case histories of two such patients were related and the X-ray films were demonstrated.

The first patient was a girl of 20, in good nutrition, admitted to the University Hospital in 1931, with dyspnea and considerable fever. There was a draining sinus in the left chest and the patient gave the story that she had had an acute illness followed by empyema in September, 1929. Following the establishment of drainage at that time the patient improved very much and was quite well up to her recent illness. On admission here a catheter was passed into the sinus after slight dilatation of the latter with a hemostat. Irrigations with Dakin's solution were made and there was a complete subsidence of fever and dyspnea. An X-ray film of the chest at that time failed to show any evidence of parenchymal lesion in the lung. There was no sputum. Collapse of the rather large pleural cavity was undertaken by a combination of rib resection and decortication. Two such operative procedures were done before complete and satisfactory closure was obtained. Tissue excised from the pleura at operation showed giant cells and the pathologist suggested the diagnosis of tuberculous empyema. Later the guinea pig inoculation made from the pus aspirated from the sinus on admission of the patient was reported positive for tuberculosis. The patient has remained well.

The other patient, a boy of twenty-four, was admitted in June, 1931, with a history of severe sepsis of seven weeks' duration. His illness was sudden in onset and a diagnosis of a pyogenic empyema of the right pleural space had been made by his physician. A serous type of exudate with intermixture of large clumps of fibrin was obtained on aspiration. After drainage following rib resection, the course remained unaltered. The fever continued high, ranging between 102° and 103° F. daily with an occasional excursion as high as 104° F. and punctuated occasionally by chills. On July 10, another rib resection was done because of suspected pocketing of pus at a lower level in the thorax. The fever persisted unabated. The patient had continually complained of considerable pain in his chest and there had been marked tenderness along the incisions. The tenderness finally localized itself to the inferior portion of the scapula and though the X-ray films of the scapula exhibited no demonstrable lesion, it was believed that an osteomyelitis was present and the lower third was excised. The patient's condition immediately improved and a striking decline in the temperature to normal occurred. Pain ceased at once and the patient became ambulant and promptly gained weight. Tissue from the scapula removed at operation showed tuberculosis and the guinea pig inoculation with fluid obtained on admission was returned positive for tuberculosis. The patient has continued to do well and has been sent to a sanatorium for bed rest.

Dr. Wangensteen said that he would like to ask Dr. Kinsella if he sees cases of this sort and whether he has had similar surprises.

Dr. D. G. Gardiner (St. Paul) suggested taking out a piece of the pleura at operation.

Dr. Wangensteen stated that in the two cases just cited pieces of pleura had, of course, been removed at operation, but the evidence obtained appeared to be in total conflict with the clinical, roentgenologic, and operative findings in each case. In the instance of the first patient who had a pleural fistula and had worn a drainage tube, he had been inclined to believe that the histologic evidence could be correlated as well with a foreign body reaction.

Dr. J. F. Noble (St. Paul) said he wished to say that from a histologic standpoint it is not always easy to be sure from a biopsy that one is dealing with a tuberculous lesion unless tubercle bacilli can be stained in the tissue. Frequently foreign body reactions closely resemble tuberculosis and at times the inflammatory reaction is non-specific in character.

Dr. T. J. Kinsella (Oak Terrace) thought that the type of patient mentioned by Dr. Wangensteen represented an example of tuberculous empyema of Group I or II as mentioned in his paper. These patients usually present a picture of an acute non-tuberculous empyema and are treated as such until the chronicity of the disease, or the persistent draining sinuses, or the character of the discharge called one's attention to the possibility of a tuberculous process. He felt that it was pretty well proven that tuberculous empyema of this type develops secondary to a small lesion in the parenchyma of the lung or in the tracheobronchial lymph nodes and are not primary infections of the pleura itself, even though clinically the underlying lung lesion cannot be demonstrated. He stated that the clinical methods of determining small tuberculous foci were rather crude and that one may be greatly surprised when viewing the pleura through a thoracoscope, or at postmortem examination to note the extensive tuberculous involvement present, when clinically there was nothing to show for it except a small clear pleural effusion.

Dr. O. H. Wangensteen (Minneapolis) read a paper on "Chronic Occult Encapsulated Empyema." Two patients were shown, together with the X-ray films. The first was a man aged forty-eight who became ill in April, 1931, with pain in the lower right chest. Fever and cough followed and the patient soon began raising sputum in fairly large quantities. There was occasional blood-streaking of the sputum. He lost 20 pounds in weight and was unable to continue at his work. When admitted on the Medical Service at the University Hospital there was considerable sputum, often as much as 400 c.c. a day, with signs of consolidation in the lung. The latter findings gradually subsided but sputum continued in lesser amounts. The sputum was negative for tubercle bacilli but contained elastic fibers. Occasionally there would be very little and again considerable would be expectorated. The patient's condition improved somewhat but the fever continued between 100 and 102° F. and there was no gain in weight. The roentgen evidence of consolidation in the right chest gradually diminished but did not clear entirely. The patient also had syphilis with a positive Wassermann reaction and an aneurysm of the transverse arch of the aorta. After repeated aspirations of the chest a purulent exudate was obtained beneath the scapula posteriorly in which streptococci and pneumococci were identified. A lateral roentgenogram also demonstrated the residual shadow in the chest to be in the posterior portion of the chest. Pus was aspirated from the right main bronchus on bronchoscopic examination, but the findings were otherwise not conclusive as to the source of pulmonary suppuration. A diagnosis of encapsulated empyema was made and rib resection was done. As the pleura was cut down upon, it appeared quite normal. The pleura was then gently pushed away from the ribs and followed in the direction in which it appeared to increase in thickness. It was then incised and a surprisingly large quantity (a pint or more) of pus was obtained.

The patient has demonstrated considerable improvement and has regained his former weight. The wound in the chest has closed and the lung appears to have expanded. Sputum is still present and varies in amount from 30 to 50 to occasionally as much as 200 c.c. in twenty-four hours. A lipiodol filling of the bronchi shows a fairly well developed cylindrical bronchiectasis of the lower lobe bronchi on the right. The aneurysm displaces the right bronchus backward considerably and its lumen appears very much narrowed. A phrenicectomy will undoubtedly permit the diaphragm to rise somewhat and compress these dilated bronchi, despite the apparent fixation of the diaphragm by the previous empyema.*

The second patient was a man aged 36 who went through a severe pneumonia in January, 1930. He was in bed one month at the time and gradually got up and resumed his work after a few months. He lost 48 pounds in weight and did not appear to recover his former strength; a mild cough also persisted. Six months after his initial illness, his physician recovered pus on aspiration of the chest and a rib resection was done followed by prompt improvement. The wound closed and the patient continued at his work, never completely regaining his strength or weight. He continued to raise sputum in small amounts and periodically would cough up a good deal. Just before admission to the University Hospital the sputum had on several occasions been blood-tinged.

The patient ran a low grade fever and exhibited the physical finding of a thickened pleura over the right chest. Despite the fact that breath sounds were not audible over the lower right chest, the heart sounds could be distinctly heard there and more clearly than in the left axilla. The X-ray findings were those of thickened pleura with a suggestion of a small effusion. Examination of the sputum for tubercle bacilli and elastic tissue was negative. No exudate was obtained on aspiration. The findings here were so suggestive of encapsulated empyema that bronchoscopy was omitted. A diagnosis of encapsulated empyema with bronchial fistula was made and rib resection was done under local anesthesia on August 8, 1931. As in the previous case, normal pleura was at first cut down upon, but when followed in the direction of increasing thickness pus was immediately encountered upon incising the pleura. About 80 c.c. of fluid could be instilled into the cavity a few days after operation; it has gradually decreased in size, however, and the drainage tube in the chest has been withdrawn until it now only extends through the parietes of the chest wall. The patient states that he has regained his usual vigor and feels quite well.

These two patients, Dr. Wangensteen stated, represented not an uncommon type of case. The patient often presents himself for the treatment of pulmonary suppuration. The presence of the bronchial fistula in such cases aids in directing the attention of the physician to the chest but at the same time it gives rise to confusion of the existing empyema with lung abscess and bronchiectasis. Dr. Wangensteen felt that a careful evaluation of the history, the physical findings, the sputum and the roentgen films should lead to correct recognition of such cases in most instances.

In the second patient, the audition of the heart sounds over the right chest where breath sounds were inaudible was interesting. Fluid is a better conductor of sound than air and it is not unlikely that this may prove to be a fairly constant finding in pleural effusion and exudates of one sort or another. Heart sounds may often be heard over the lower abdomen in peritonitis in which a gaseous and fluid distension of the bowels together with the presence of a fluid medium between the coils of bowel serves as a good resonator for sound transmission.

An antero-posterior and a lateral film of the chest serve as the best indication for the location of the incision in the absence of a conclusive needling of the chest. Thickening of the pleura at operation suggests a proximity to the purulent encapsulation. Dr. Wangensteen urged operation and exploration of the chest in such cases to rid the patient of his continued pulmonary suppuration.

DISCUSSION

Dr. T. J. Kinsella stated that these cases of occult or localized empyema were interesting not only from the standpoint of diagnosis but also from the standpoint of treatment. They not only are frequently not diagnosed, but quite frequently misdiagnosed. He recalled one seen recently which had been diagnosed as lung tumor in which the early history was certainly indicative of empyema rather than of pulmonary malignancy. He mentioned another seen recently with typical history of pneumonia followed by empyema in which, because of a few unsuccessful attempts at aspiration, the diagnosis of empyema was discarded. When seen in consultation, two circumscribed pockets were localized by physical examination and pus obtained from both through an aspirating needle. The underlying principle in the treatment of this type of empyema is obliteration of the pleural space after evacuation of the pus by expansion of the lung to the chest wall if possible, because the lung itself is normal or relatively so in contra-distinction to many cases of tuberculous empyema in which the underlying lung is badly diseased with tuberculosis which demands a lung collapse and the obliteration of the pleural pocket by collapsing the chest wall down to meet the visceral pleura.

Dr. Wangensteen agreed with Dr. Gardiner that bronchoscopy was a valuable agent in the differential diagnosis of chest condition but stated that in suppurative lesions the findings were often indefinite and he was of the opinion that a careful interpretation of a well-taken history aided materially in getting properly orientated in such cases. Here were two patients, both of whom apparently had had pneumonia. The continued illness in either instance may have been due to lung abscess or empyema. In lung abscess there is usually considerable sputum continually; but if an encapsulated empyema with a bronchial fistula be present there is often a lot of sputum expectorated periodically with intervals during which only a little sputum is raised. With the ordinary criteria which everyone has at his command, these cases should be correctly recognized in most instances. The sputum of lung abscess usually exhibits elastic tissue; that of encapsulated empyema with bronchial fistula usually not. Both of these patients finally did well, but unnecessary suffering and considerable time could have been saved them, particularly with the last patient, by an earlier intervention.

Dr. Wangensteen stated with reference to Dr. Kinsella's remarks on carcinoma of the lung and sepsis that he too had seen several cases such as these in which the patient appeared to have a pulmonary suppuration. In one instance he operated upon a patient for lung abscess and the patient had twice previously been operated upon elsewhere with the idea in mind that he had pulmonary suppuration. Only shortly before the death of the patient was it even suspected that he might have a carcinoma of the lung. One common mode of manifestation of carcinoma of the lung, Dr. Wangensteen felt to be that of a pulmonary mass as visualized on X-ray examination accompanied by fever and chills. Sputum may or may not be present. The loss of weight is usually impressive and the patient often presents the appearance suggestive of malignancy. Within the last year he has seen three such cases, all of which were correctly diagnosed when first seen. However, Dr. Wangensteen said, one can take little pride in recognizing them when so little can be done for them.

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*A phrenicectomy has been done, following which there was a material reduction in the expectoration.

Dr. Daniel H. Bessesen (Minneapolis) read a paper on "Certain Dangers From Spinal Anesthesia; thrombo-embolic disease, postoperative hemorrhage, sudden death, the exhausted or debilitated patient."

There are certain diseases or conditions occasionally referred to in the literature which cause peculiar dread and assume, in some cases, the proportions of the mysterious. These are thrombo-embolic disease, postoperative hemorrhage, sudden death and the effects of surgery upon the exhausted or debilitated patient. We have all had occasion to experience or draw conclusions concerning each of these complications, during or following the administrations of other anesthetics, but it may be well to consider them from the standpoint of spinal anesthesia.

Thrombo-embolic disease is one which at varied times causes death in from 0.1 to 0.5 per cent of all patients and occurs in all types of cases, most often appearing among otherwise healthy individuals, in clean as well as infected surgical cases, in all ages of life. It is possibly slightly more common among women, and favors patients with mild or long-standing infections. Giertz and Crafoord believe it to be essentially a surgical disease, finding a ratio of embolism between cases treated surgically and similar cases non-operated of 1 to 5.3. A. W. Meyer at the Charlottenburg Krankenhaus in Berlin, however, observed as many cases on the medical service as on the surgical. Bunzel reported 32 cases in 31,715 labors, though he reported it more frequently in operative deliveries than in spontaneous. So it may occur in surgical, obstetrical or medical patients.

There seem to be certain veins which are more susceptible to thrombo-embolism than others. Eighty-six per cent of all thrombi occur below the diaphragm, approximately 50 per cent in the left femoral vein. Other locations predisposed are the pelvic plexus of veins, the venous network of the dura mater, the auricles and prostatic vessels. Vessels in which the supine position causes a release of the overpressure observed in the upright position, produced by either blood or viscera, are especially predisposed. A widening of the vessel as in the auricles and in the veins at each valvular sinus, the possibility of a backward pulsation in the veins, the crossing of the left femoral vein by the inguinal ligament, the left hypogastric artery and the right common iliac artery are anatomic facts of importance in the etiology of the disease.

Aschoff places importance upon four possible factors, one or all of which may play a part in the production of the spontaneous thrombus changes in: (1) blood plasma; (2) blood elements; (3) the blood flow; (4) the vessel wall.

The mechanism of thrombus formation as gradually derived from the work of Virchow, V. Recklinghausen, Ferge, Aschoff, and others, seems to show that the platelets are deposited on the bed of the vessel as sand is piled on the bed of a stream in response to changes in its current such as whorls or eddies. Fibrin attaches to these hillocks. The leukocytes, being lighter than the red cells, drift to the margins of the stream and are caught in this network of platelets and fibrin and the process is repeated until the entire stream is blocked. The portion of blood between the obstruction and the next main channel then solidifies as a clot. This long clot when dislodged within the circulation may go to any part of the body and will find its embolic rest in accordance with its size.

A thrombus which is visible or palpable is usually of smaller caliber than one which is latent. Embolism from a manifest thrombus must be repeated to be fatal, while embolism from the latent thrombus is the fatal acute obstructive pulmonary embolism. The former is not subject to surgical removal; the latter has been removed nineteen times, with seven successes.

Waltman Walters has recommended thyroid substance together with early active movement as a preventive of thrombus formation. Essen-Moller used these methods in 300 surgical cases, with 300 controls, but notices no difference in ratio between the two series. Lately Rankin has reported that their observations at Rochester have likewise shown no lowering in percentage of thrombus formation since the institution of these methods.

Aschoff considers the variation in blood flow as the most important of the causative factors. Since spinal anesthesia has a faculty for temporarily lowering the arterial tension, it naturally follows that there might be some tendency on the part of this form of anesthesia to favor thrombus formation. Reports of this sort are not sufficiently frequent or numerous to know if there is an increase of this disease in cases where spinal anesthesia is used. There is probably no increase, since the disease is observed in all varieties of cases and under all types of treatment, and following the administration of all anesthetics.

A case occurred in my practice recently in which, for a pelvic repair, two injections of novocain were given into the spinal canal: the first of 150 mgm. novocain, for the perineal work; the second of 200 mgm. for the abdominal repair. These large doses were used because the patient was heavy. The operation was performed upon a Saturday; the patient died the following Wednesday from acute obstructive pulmonary embolism. The diagnosis of latent thrombus was evident from the fever, restlessness and gastric distress of the patient, combined with the sign described by Mahler, in which the pulse is more rapid than the temperature and respiration warrant. Death occurred in the presence of all members of the patient's family within fifteen minutes of the embolism.

Postoperative hemorrhage may occur in the presence of icterus, hemophilia, toxemias of various sorts. The mechanism which is attributed to spinal anesthesia is that the fall of pressure permits a vessel to be incised without exhibiting any large flow of blood. The failure to clamp and ligate this vessel which naturally follows, leads to oozing from that vessel when later the blood pressure increases. Rankin especially has emphasized this complication. Whether he has experienced this frequently or not I do not know, but Rankin is a strong exponent for spinal anesthesia. In my own practice I have observed postoperative hemorrhages apparently of this origin. The painful fact concerning postoperative hemorrhage is that if the bleeding is not stopped, death is certain. Unfortunately postoperative loss of blood often occurs in individuals who have been subject to severe surgical procedures and the manipulation necessary to stop bleeding may produce enough additional shock to end the patient's life. There can be no demonstration of surgical judgment in such a case, however, as the choice lies between a 100 per cent mortality and the possibility of life. Fortunately the loss of blood produced by this particular cause of postoperative hemorrhage is slow.

Sudden death is a condition I have not encountered. It must be a terribly shocking experience. The true facts concerning this tragedy are not definitely known. One may theorize about it, however. There may be the nerve shock of the lumbar puncture, the pressure of the brain into the spinal canal with compression of the medullary centers. There may be injection of novocain into the blood stream with its attendant reaction or one can visualize the possible spread of the anesthetic solution to the respiratory centers, though this possibility has never been clearly demonstrated. Also there remains the occasional drug idiosyncrasy which may explain sudden death. One wonders if W. W. Babcock has ever encountered this complication. With his vast experience with spinal anesthesia, it may be that some of his deaths or threatened deaths could fall under this classification, but you remember he says that if you cannot have an operating room force which is so equipped as to get fluid into the patient's veins within 20 seconds of the start of that patient's reaction, you should not use spinal anesthesia. In a recent collapse on the table which one of my patient's suffered (under gas anesthesia) it was five minutes before the needle conducting the fluid could be introduced into the vein. By that time, the blood clotted in the veins, no matter where the attempt was made for venoclysis. We were forced to depend upon a combination of stimulants—adrenalin, caffein, sodium benzoate, pituitrin, ephedrine, camphor, and coramine—combined with the head lowered posture, and fluid by rectum. Though the patient survived this reaction, the strain of the imminent death was terrific. If Babcock can secure intravenous fluid in 20 seconds this may explain the absence of sudden deaths in his last 18,000 to 20,000 cases. It may be strongly recommended that all hospitals adopt this method of dealing with emergency complications in the operating room.

Thrombo-embolic disease, postoperative hemorrhage, and sudden death are complications of infrequent nature. The consideration of the exhausted or debilitated patient, is, however, one which is less uncommon, and with which everyone is at some time forced to exercise his judgment in the selection of an anesthetic. This type of case is not a desirable risk under any form of anesthesia and should be most carefully watched under spinal anesthesia. The exhausted and debilitated patient will not tolerate even a temporary fall in blood pressure. About five weeks ago, I had a patient who presented the following record. After taking a nine hundred mile trip with one hour's sleep he presented an acute mass in the upper right abdomen, with vomiting of 24 hours' duration. He did not eat for another 24 hours' time, during which a diagnosis was established which called for a really severe surgical procedure. This was undertaken under spinal anesthesia and the operation was discontinued before completion because of the patient's bad condition. A second operation was required to finish the procedure, from which also he convalesced only after a terribly trying reaction of 24 hours' duration, and he might have had the same results under any other anesthesia than the one used. We have no controls on which to base an opinion, but one wonders sometimes if a surgical patient might be slightly more responsive under a different management, and so it is in this case. A long protracted prostatic illness and cases of hemorrhage are other types, concerning which extremely good judgment is required for the selection of the best anesthesia.

It is natural to analyze one's experiences with a newer form of procedure, and it seemed a suitable time to look through some records on unfortunate cases dealt with surgically under spinal anesthesia. The studies on thrombo-embolic disease, postoperative hemorrhage, sudden death and results of surgical procedures on exhausted and debilitated patients impress me with the fact that some judgment must be exercised in the selection of anesthesia for various patients, with the need for immediate fluid injection attendant upon emergency complications in the operating room, and with the unquestioned excellence of spinal anesthesia when these various possible contingencies are kept in mind.

DISCUSSION

Dr. R. J. Moe (Duluth) said he would like to mention another danger which they experienced, namely blood pressure of 180 or over. It had been their experience that such patients do not tolerate a decided drop in blood pressure. A drop from 200 to 120 is not tolerated as well as a drop from 120 to 60 or 70. This is accounted for by the fact that the high blood pressure has been accommodated for by the patient. Recently they had been more guarded in operating this type of patient than they had been in the past.

Dr. G. A. Williamson (St. Paul) asked how long Dr. Bessesen felt it was necessary to keep the patient in the Trendelenburg position.

Dr. C. J. Ehrenberg (Minneapolis) called attention to a report some months ago in Surgery, Gynecology and Obstetrics of some French neurologist who had been working on patients who had had spinal anesthesia. They reported a number of findings of paralysis in the lower extremities, the spinal anesthetics having been given ten or more years before. Their impression was that it was due to some injury from the anesthetic.

Dr. Bessesen stated that the length of time for the Trendelenburg position should be at least three hours, or between three and six hours, if the postoperative condition of the patient does not contra-indicate it. He thought the patient should not have a pillow the first twenty-four hours at least. Concerning nerve injury, he believed that novocain was not used so extensively nine or ten years ago but that stovain was used about that time and if he was not mistaken that had been known to produce nerve injury. He did not believe novocain has such a tendency to produce nerve injury.

Dr. Edward T. Evans (Minneapolis) read a paper on "Delayed Lesions Following Trauma of the Hip."

In 1914 Axhausen, in an article entitled "Bone Necrosis and Sequestrum Formation" stated that "mild inflammatory reactions, particularly when associated with embolic or thrombolic processes and due to low grade micro-organisms, may sometimes result in necrosis which is followed by simultaneous absorption of dead bone and incomplete, irregular replacement by new bone."

We now know that necrosis may result from a number of so-called aseptic causes, namely injuries, vascular disturbances, chemical action, and radium.

Much has been written on this subject in the past few years and Phemister of the University of Chicago has studied this problem so thoroughly that I take the liberty of calling "aseptic necrosis" of the head and neck of the femur following trauma, "Phemister's Disease."

For a clear understanding of his concept of aseptic necrosis, I would refer you to his paper read before the American Orthopedic Association in June, 1930, and published in the Journal of Bone and Joint Surgery in October of that year.

In presenting these cases I wish to stress only two points: (1) the dire necessity of appreciating fully the blood supply variables of the hip joint in the early handling of a case of hip injury, and (2) the necessity for careful supervision and follow-up in the functional restoration of the part, involving above all a knowledge of how bone heals and the influence of function upon that healing.

Quoting from Phemister's article, is the following:

"The fate of bone which undergoes aseptic necrosis as a result of circulatory disturbance varies considerably, according to the environment of the necrotic area. If the necrotic bone is attached to and directly continuous with living bone, there is ingrowth of vessels and of fibrous and osteogenic tissues from the living into the necrotic area. There is usually survival of unossified osteogenic elements about the periphery and ends of the area that has had its circulation interrupted. By the process of creeping substitution the old bone is gradually absorbed and replaced by new bone, so that in the course of months or occasionally years the necrotic area is more or less completely transformed into a living one. Whether the amount of new bone formed is as great as the amount of bone which died depends largely upon the extent of living bone with which it is in contact and the amount of osteogenic elements surviving about its periphery. When these are both extensive, there may be complete replacement of the dead bone by new bone; but when limited, bone absorption may be greatly in excess of bone formation, so that incomplete replacement results, with the formation of bone that is less dense than the original and that shows varying degrees of cavitation. Functional stimulation also plays an important role in the rate and degree of transformation. In general the greater the degree of function the greater the rate and degree of transformation into new bone. If the necrotic bone is largely or wholly intra-articular and extensively bordered by articular cartilage, the attachment to the surrounding soft parts will be markedly limited and chances for revascularization and transformation will be greatly reduced."

In fractured neck of the femur, "If bony union occurs, the head is gradually invaded by the ingrowth of tissue from the distal fragment and sometimes from the hypertrophied round ligament. The necrotic marrow is replaced by vascular connective tissue and eventually by bone marrow, but the necrotic bone is much more slowly absorbed and replaced by a variable amount of irregularly arranged living bone. The necrotic cartilage is slowly absorbed and replaced by fibrous tissue, fibrocartilage, and to some extent eventually by new hyaline cartilage. If too much weight is borne on the head before it has been transformed into new bone, its weight-bearing portion may collapse with a resultant deformity and poor functional result, but this may be averted by prolonged avoidance of weight-bearing. The functional stimulation which comes from motion of the limb without weight-bearing is sufficient to hasten transformation of the head."

Case 1.—On October 20, 1929, this patient, then twenty-nine years of age, dislocated his left hip in an automobile accident. Reduction was successful as shown in this plate. The hip was not fractured. The patient made a normal convalescence and walked in six weeks and for approximately eight months had no discomfort.

About six months prior to my seeing him in February, 1931, he began to have pain in the left hip which gradually increased until he sought relief by applying for examination at the United States Veterans Bureau.

This X-ray shows the condition, February 14, 1931. The first X-ray was sent for and unsuspected fracture ruled out. The patient was placed in a plaster spica with bed rest for eight weeks with complete relief of pain. This was followed by weight bearing in the spica for a time and then the caliper brace, which he still wears when ambulatory.

The X-rays of May, July and October, show the gradual restoration of bone under protected functional use. There is no pain, the patient is happy and though he may later require arthroplasty for mechanical reasons, it is believed there will then be good bone to utilize for the reconstruction of his hip.

Case 2.—These X-rays are those of a woman of fifty-four who sustained an intracapsular fracture of the neck of the femur in June, 1928. It was beautifully reduced by a very competent man, the recovery was rapid, and she returned to her home to carry on an active social life, including dancing and a prolonged European trip.

The convalescence was considered complete until last December when pain developed.

The X-rays show the progressive late necrosis occurring (December, May, September).

The patient is doomed to one of two courses: (1) prolonged protection from weight bearing combined with functional use as allowed in a caliper brace (this, she refuses); (2) surgical reconstruction.

Dr. Myron O. Henry (Minneapolis) read a paper on "Osteosynthesis in Intracapsular Fracture of the Hip of the Dog."

In this work, fifteen experiments were performed upon the right hips of adult dogs of unknown age. After careful preparation of the skin and etherization, the right hip was exposed by a muscle splitting incision, severing only the tendon of the quadratus femoris muscle. The ligamentum teres was severed in order to dislocate the hip. An intracapsular osteotomy was then performed.

Round nails made of rustless steel were used to peg on the free head from the proximal side, after the method of Hey Groves, in four experiments. These nails failed to hold in every case without external immobilization and the round nail was therefore discarded as a means of internal fixation.

A highly polished, rustless steel screw was then devised by the author, having coarse double-pitched threads and a slot at both ends. Such a screw was introduced through a drill hole the size of its core, made through the head and neck of the femur, entering at the fovea capitis and passing along the axis of the neck to bite well into or through the cortex on the lateral side of the trochanter.

Four animals were immobilized in plaster of Paris spica casts after such an osteosynthesis had been performed. All four died, three of pneumonia, and one presumably from distemper.

The modern trend seems to be away from prolonged immobilization in the treatment of fractures near joints. Early active motion is thought to stimulate healing by maintaining normal circulation and preventing atrophy of disuse.

In seven successful experiments, no external fixation was used, and the animals were usually found getting about with stable hips a few days after operation. A dog, having four legs, will not use a painful or unstable extremity at all. Motion pictures were made to record the stability and degree of function in the seven successful experiments.

Conclusions.—Hey Groves method of proximal osteosynthesis was performed in fifteen experiments on dogs whose epiphyseal lines were no longer discernible on X-ray.

Round nails were found inadequate for fixation of intracapsular fractures of the hip without external immobilization.

All animals immobilized in plaster of Paris spica casts died.

A rustless steel screw of special pattern secured satisfactory apposition of the fragments of intracapsular osteotomy of the neck of the femur and maintained adequate fixation of the fragments without external immobilization.

Such a screw is practically inert in bone.

Complete bony union with revivification of the head occurred within forty-nine days in the animals sacrificed for microscopic study.

The capital fragment, devoid of all soft parts, in intracapsular osteotomy of the neck of the femur of the dog, readily unites and revivifies under the proper physiological conditions essential to the healing process in bone.

Early, continuous, and accurate contact, with absolute fixation of the fractured surfaces, is of paramount importance in the healing of fractures in the presence of synovial fluid.

DISCUSSION

Dr. Bessesen asked if the screw penetrated the trochanter what would be the results of leaving the screw in place?

Dr. Henry said that that was the intention, that he had tried to have the screw project through but only in the white dog did it show. He had decided, if he felt justified in doing this on the human, that he would have the screw much longer. There would be no need to remove it, as it was rustless steel and produced no reaction. He thought it would be all right to leave it in place.

Dr. Williamson asked if there was any absorption of the head.

Dr. Henry said no, not in the successful cases of this series. The head was chiseled off smoothly and he thought a fractured hip would be easier to do, because the edges of the fracture line were irregular.

Dr. Bessesen asked if there was any necrosis of the head, free of soft parts.

Dr. Henry stated that these heads were necrotic bone, temporarily, which revivified. He had microscopic slides showing the head and neck forty-nine days after operation showing no evidence of the line of osteotomy. He said if there is sepsis the head dies. He felt that more experimental work probably should be done along this line before the procedure could be tried on the human.

Dr. C. J. Ehrenberg (Minneapolis) read a paper on "The Use of the Cautery in the Treatment of Diseases of the Cervix."

Casual inquiries at a number of private hospitals, and the University of Minnesota Hospital reveals that a considerable number of operations are being done on the cervix uteri under the diagnosis of cervicitis, endocervicitis, erosion, laceration of the cervix, and infection of the cervix. While the writer has no wish to recommend the exclusion of surgery in the treatment of these conditions, recent gynecological literature tends to show that the subject of surgery versus cauterization and its allied therapeutic agencies is gradually becoming less controversial, and that more and more the tendency is towards cauterization. So that the recommendation of this last named therapeutic agent is justified.

The high incidence of disease of the cervix uteri is obvious to one who practises among women. And, while time limitations preclude an extensive discourse, a brief mention of those conditions underlying most cervical pathology is necessary to evaluate the benefits of the recommended treatment.

The cervix uteri is an organ having structural, functional, and locational peculiarities, which predispose it to infections both acute and chronic. Acute infections are usually of two kinds, those secondary to parturition and those due to gonorrhea. These are treated as acute infections in any other location, namely supporting treatment to the natural processes of healing. The structure of the cervix, however, is such that acute infection usually terminates in a chronic condition which demands some type of further treatment for cure.

The results of chronic infection of the cervix uteri are classified into two groups: those having constitutional relationships, and those having local relationships. It is now an accepted fact that chronic cervicitis is a focus of infection along with the other common sites of focal infection. And the writer has reason to believe, from numerous observations, that an interrelationship exists between infected cervices and other foci of infection; the existence of one being dependent on the existence of the other. Any constitutional illness demanding elimination of foci of infection must include the removal of any infectious process from the cervix.

The local symptoms arising from the chronic infected cervix uteri are many; leukorrhea, back pain, and lower abdominal pain are those most common, the latter being often a consideration in the differential diagnosis of abdominal disease. Another of the sequelæ of cervical disease is sterility, this commonly being stated as the greatest single cause of the secondary type of this condition.

The foregoing presupposes that infection is the essential factor in the pathology of the cervix. And, excluding new growths, such is the case. Treatment then must satisfy a number of requirements: (1) the thorough elimination of the focus; (2) a result which does not interfere seriously with any further functional demands of the organ. Secondary factors essential for consideration are: (1) the ease with which the treatment can be applied according to the facilities at hand and the necessary dexterity of the operator; (2) the economic aspects such as the length of the period of disability, the hospital fee, and the physician's fees.

Until recently, the accepted form of treatment has been of two kinds. The first or medical, consists of topical application of some type of astringent or antiseptic solution, or both, in conjunction with a hydragogue tampon. This treatment ordinarily violates only the first of the above stated requirements. While it may suffice in some cases to ameliorate the condition and to cure in a few mild cases, it generally does not eliminate the infection thoroughly. The second kind of treatment, namely, the surgical, was evolved through the failure of the first. Numerous operations were designed to remove the gland-bearing area of the cervix which was sufficiently deep-seated so as to be impervious to local applications. This treatment usually violates the second of the requirements, namely function, and further requires all of the facilities for a major surgical procedure, a trained surgeon, and a period of confinement, which, to say the least, is uneconomical.

Cauterization of the cervix uteri, though popularized in the last few years, and though still in the period of exploration, is not entirely new. Dr. Robert Dickenson has used the method for about twenty-five years. Without tracing the historical progress, the perfection and development of electrical equipment, along with the exploitation by commercial institutions, has done much to popularize the cautery and the electrode knife.

The writer, having had little experience with the electrode knife and having derived much satisfaction from the use of the cautery, wishes to outline the simple technic. The time of the cauterization in relationship to the menstrual cycle is of some importance; the period for cauterization being confined to the days intervening between the fourth day post-menstruation and the tenth day preceding the expected menstrual period. Pregnancy is a definite contra-indication to cauterization although in a number of cases of cauterization of the cervix as a treatment for sterility, the second cauterization was done without apparent disturbance at a time post-dating the subsequent pregnancy. Acute cervical inflammation and any type of acute pelvic inflammation contra-indicates cauterization the same as surgery.

The procedure can usually be done in the office without the use of a general anesthetic. Where the lesion is widespread or in cases of previous surgical measures a light general anesthetic may be given. The patient is put in the dorsal position with the thighs well abducted. The cervix is well exposed through the Graves speculum, a tenaculum forceps or a hood being used if necessary. The vagina and cervical canal are cleansed and an anesthetic solution is applied to these regions. A number of cauterization speculi have been devised, but a second Graves speculum (Peterson's modification) inserted transversely is very satisfactory. The speculi serve to insulate the vaginal walls from the heat. The patients are warned about the sound and odor of the procedure. Cauterization is then done, care being taken to withdraw the cautery frequently, so that the radiated heat on the vaginal walls will not become too intense. Apprehensive patients may complain of some pain on applying the cautery to the cervix. Experience, and various types of lesion, such as laceration, eversion, erosion, and cystic conditions guide the operator in determining the area to be cauterized. Two models of the Post cautery are used, one the knife blade tip and the other the large blunt tip, the employment of one or the other being dependent on the type of lesion. Occasionally the external os is dilated previous to the use of the cautery for a lesion in the cervical canal.

Only occasionally is there an immediate reaction to this procedure and then only of a psychic nature, as fainting. Also occasionally the patient will complain of some lower abdominal discomfort for the remainder of the day.

Following cauterization, a leukorrhea, often of a profuse nature, appears and remains from ten to fourteen days. This is easily controlled by douches once or twice daily. From the seventh to the ninth day following the treatment there may be some vaginal bleeding which is due to the separation of the slough. On a number of occasions the menstrual period following the treatment has been complicated by a severe menorrhagia, but, since the avoidance of cauterization during the ten days preceding menstruation, this complication has not arisen.

Complete healing does not take place until about six weeks after the treatment.

Often the application of a single treatment does not suffice and it must be repeated once, twice, or even three times before the desired result is obtained, although invariably symptoms are much diminished following the first treatment.

The writer's confidence in cauterization is so complete that no operative procedure has been attempted for some years. As mentioned before, there have been a few occasions when cauterization has relieved what previous surgery did not. Cauterization is used commonly postpartum on the minimal lesions so often seen, but never before six weeks have passed. A number of patients cured of a cervicitis following one pregnancy have passed through a second and third pregnancy without further demonstrable pathology of the cervix.

DISCUSSION

Dr. Bessesen asked if the treatment is used in pregnancy, and, if so, are there any changes in the technic.

Dr. Ehrenberg stated that in pregnancy he felt that it was contra-indicated, although one case when he had cauterized the second time it was very apparently very early in pregnancy.

Dr. J. J. Swendson (St. Paul) asked if the procedure is known as coagulation or carbonization.

Dr. Ehrenberg replied that the process is one of carbonization.

Dr. Swendson said that he had been greatly interested in this work and wished to call attention to the danger of stenosis occasionally following cauterization of the cervix. He had seen cases with a resulting pyo-endocervicitis causing focal symptoms which subside when the cervical canal was dilated and drainage established. He called attention to differences of opinion held as to the preferable method of cauterization, stating that Dr. Heaney of Chicago had abandoned linear cauterization because of resulting hemorrhage at times, and was doing flat cauterization in all cases. He also noted that there was recent mention in the literature of the benefit following cauterization of infected cervices during pregnancy and stated that no complications of the procedure had been observed.

Dr. Ehrenberg said that, with the lesion limited almost entirely to the cervical os, such as laceration and eversion, one is not apt to burn the external os and get contractions. For this reason, Dr. Dick recommends the platinum wire cautery as this can be put inside the cervical canal and the cauterization done there. Dr. Ehrenberg said he took a Hegar dilator and dilated the external os before inserting the Post cautery inside the cervix. There is some evidence that cauterization of the cervix may produce an endometrial change. He had the experience of having a menorrhagia following cauterization of a cervix. For this reason cautery is not done during pregnancy as he would not care to take the chance of producing a miscarriage. Even if the miscarriage were not due to the cauterization, one would likely be blamed. Also, the cervix, during pregnancy, is subject to considerable variation of size and shape, and one would get a better idea of the normal if cauterization is not done during pregnancy.

Dr. Leo G. Rigler (Minneapolis) gave a lantern slide talk on "Benign Tumors of the Stomach."

ABSTRACT

The benign tumors of the stomach are far more common than has previously been supposed, comprising, in the author's experience, about ten per cent of all gastric neoplasms observed. The polypi are the most common variety. Clinical diagnosis is difficult and in many cases impossible.

Roentgen examination when carefully done will reveal these lesions in almost all cases. The technic is of great importance, the use of pressure and only a small amount of the barium mixture being the essential features. The presence of a sharply outlined, round, filling defect which is central in position, somewhat movable, and shows normal peristalsis and flexibility of the gastric walls about it, is diagnostic of a benign tumor.

Those polypi which are located in the antrum of the stomach and are pedunculated may prolapse through the pylorus into the duodenum. Acute pyloric obstruction may thus occur with striking symptoms which may be completely relieved spontaneously only to occur again at a later date. In these cases the defect may appear to be in the duodenal bulb. In one case the author was able to demonstrate by manipulation under the fluorescent screen this prolapse of a papilloma through the pylorus.

Occasionally a benign tumor may slough off producing severe hemorrhage, symptoms of acute ulceration, or other findings. No scar whatever may be left on the mucosa. In such a case the X-ray findings may not be substantiated at operation due to no fault of the examination. The author has seen two such cases in one of which the sloughed fragments of the tumor were found in the stomach without any evidence in the mucosa to indicate their origin. Not infrequently the polypoid type of tumor may not be palpable even after the abdomen is opened and it is necessary to open the stomach before they can be excluded.

Benign tumors, especially the adenomata, adenomyomata, papillomata, and fibromyomata, are frequently multiple and they may produce a sponge-like appearance in the gastriic roentgenogram—gastric polyposis. A similar appearance may be produced by a markedly hypertrophied or swollen mucous membrane without any real neoplastic tissue being present.

Recurrence of the tumors may take place after operation, although it is not common.

Malignant degeneration of these benign lesions is not uncommon and forms one of the indications for operation. It is possible that ten per cent of all gastric carcinomata arise in this way. In one case the roentgen examination revealed the typical picture of multiple benign polypi of the stomach. Nine months later, on the second examination, definite infiltration of the greater curvature with loss of peristalsis could be made out. At autopsy, benign and malignant tumors were found side by side.

Occasionally benign and malignant tumors may be demonstrated in the stomach at the same time, the two having no apparent connection.

Surgical removal of these benign neoplasms is indicated both to relieve symptoms and to prevent their degeneration into carcinoma.

DISCUSSION

Dr. J. F. Noble (St. Paul) stated that, for the purpose of general discussion, benign tumors of the stomach may be classified as adenomyomata, leiomyomata, and papillomata or polypi as they are generally called. Fibromata have been reported as occurring in the stomach but careful study has usually proven these tumors to be myomata. Lipomata have also been found in the stomach.

From a clinical standpoint, the adenomyomata are of relatively little importance. They are generally considered to be congenital in origin and arise from misplaced gastric or intestinal glands located in the muscle layer of the stomach. Their structure and origin are very similar to pancreatic and adrenal rests, which are also occasionally seen in the stomach wall. These tumors are, as a rule, accidental autopsy findings and are usually small.

Leiomyomata are also generally considered to be rather rare in the stomach but some recent work by

Rieniets, a Fellow in Surgery at the Mayo Clinic, has clearly shown them to be the commonest benign tumor of the stomach. Dr. Rieniets has kindly allowed the author to read his thesis, which is as yet unpublished, and to use some of his material in this discussion. In a study of 200 autopsy cases he found forty-three leiomyomata in thirty-two of the stomachs or in 16 per cent of the cases. Most of these tumors were small and of no clinical importance but his figures definitely show a surprising frequency for this type of tumor. Exclusive of this group he also studied all of the autopsy records at the Mayo Clinic for a six-year period and discovered only thirty-four tumors described, pointing to the fact that many of these tumors are overlooked in routine autopsies. He also included in his work twenty-one leiomyomata which had been removed surgically. From this series of cases he has brought out much interesting data.

He shows that the tumors may occur at any age, though they are much more commonly seen in older individuals. They are more common in males than in females. The tumors found at autopsy were commonly seen at the cardiac end of the stomach and those surgically removed were for the most part near the pylorus and at least four of them caused definite obstruction. These tumors may arise from either or both muscle layers of the stomach and may be intramural or pedunculated, the pedicles being attached either to the serosa or mucosa of the stomach. None of his tumors showed evidence of malignancy. Hausmann and others, however, have reported definite malignant smooth muscle tumors of the stomach. Rieniets also points out that these tumors may cause intussusception, mucosal ulceration and even perforations.

Next to leiomyomata, papillomata or polypi are the most common benign tumors of the stomach. They are of much more clinical interest because they are readily diagnosed by X-ray, as Dr. Rigler has shown, and because they are known to undergo malignant change. They are not uncommonly found accidentally at autopsy, either as single tumors or much more rarely as multiple tumors covering the greater portion of the gastric mucosa. Ewing describes this condition as gastritis polyposa. Multiple polyposus, however, is much more commonly seen in the large intestine. The tumors are pedunculated or sessile. They are papillomatous in structure, covered with fairly normal gastric mucosa and are supported by a connective tissue core carrying the blood vessels. Torsion followed by gangrene and complete disappearance of the tumors has been described by many writers and the writer believes that Dr. Rigler's case is best explained in this way. These tumors, because of their papillary structure, are also very prone to ulcerate and occasionally this ulcer causes severe hemorrhage as seen in another of Dr. Rigler's cases. From a clinical standpoint, however, the relationship of these tumors to gastric malignancy is their most important feature. From the work of Verse and others we can say quite definitely that most gastric carcinomas do not arise from polypi but rather from localized foci of malignant degeneration in previously normal gastric glands but occasionally they are responsible for clinical carcinomata of the stomach. Dr. Bell has observed two of these cases and other workers have followed these changes. It is common knowledge that malignancy frequently follows polypi of the rectum, bladder and other mucous surfaces. It would seem to be a good general rule to consider all papillomatous growths of mucous surfaces as potentially malignant tumors and to treat them accordingly.

Dr. Harold Leland (Minneapolis) read a paper on "Ascheim-Zondek Reaction."

Laboratory tests for pregnancy are at least 3,000 years old as evidenced from an Egyptian papyrus reading: "A woman may determine if she is pregnant by taking some earth and barley in a vessel and adding to it day by day a little of her urine. Should the barley grow, then she is pregnant, but if the grain does not grow, then she will not bear a child."

In 1928 two German investigators, Ascheim and Zondek, in the Klinische Wochenschrift, reported a more reliable and accurate test for pregnancy which bears their names. The principle was derived from the fact that when 10 mgms. of hypophysis were implanted into the muscle of the thigh of an infantile mouse, the animal went into estrus after four days. Normally a mouse weighing 12 gms. goes into estrus in the sixth weeks. The above experiment was done on mice three weeks old weighing about 6 grams. The estrual changes in the vaginal mucosa are not directly caused by the hypophyseal hormone given off from the implanted material, but indirectly by way of the ovary. The hypophyseal substance makes the infantile ovary mature, and this leads in turn to the changes in the vaginal epithelium.

Ascheim and Zondek in hundreds of experiments and thousands of serial sections have shown that there are three chief morphologic changes produced in the infantile ovary under influence of the hypophyseal hormone. The ovary of the immature mouse contains only primordial follicles and small graafian follicles without cavities. The first change caused is growth of the follicles, leading to rupture and discharge of ova into the tubes. Second, there occur hemorrhages in many of the enlarged follicles which are visible to the naked eye as cyanotic dots. Finally atretic corpora lutea are formed in the ovary by luteinization of the follicles which have not fully matured. The substance, which, in the implantation experiment makes the changes in the ovary, is present during pregnancy, as Ascheim has found, in the decidua, in the corpus luteum, in the placenta, in the amniotic fluid, in the young embryo, in the blood serum in large quantities and, most important, in the urine of the pregnant woman. This excretion of the hypophyseal hormone in the urine of the pregnant woman forms the basis of the Ascheim-Zondek test.

Technic: The first specimen in the morning is the best for use. Five mice are used each weighing from 6 to 7 grams. The injections are given with a tuberculin or insulin syringe into the back of the animal. Three injections are given the first day consisting of 0.2 c.c. for the first mouse, 0.25 c.c. for the second, 0.3 c.c. for the third and fourth and 0.4 c.c. for the fifth. Three similar injections are given the second day. One hundred hours later the animals are killed and the ovaries examined. When the test is positive, the ovaries are two to three times the normal size (which is the size of a pin head) and are red, presenting cyanotic protrusions due to hemorrhage into a follicle or a corpus luteum. If there is doubt about the ovaries, serial sections are made by fixing in Zenkers and embedding in paraffin. The microscopic finding of even one single corpus luteum renders the test positive.

But great difficulty exists in maintaining a colony of white mice 21 days old and weighing six to seven grams. So Friedman modified the above technic using young rabbits weighing not less than four pounds which had been carefully isolated in separate cages. It is known that the rabbit, although its ova continuously ripen, does not ovulate until after copulation. Thus it is possible to study the effect of the urine on ovaries free from corpora lutea and corpora hemorrhagica. From 7 to 15 c.c. of urine, usually 10 c.c., are injected into the marginal vein of the rabbit's ear. Thirty hours later the animals are examined. Positive tests are indicated by the presence of corpora lutea and corpora hemorrhagica, which are detected by gross inspection.

Results.—In 1,000 cases Ascheim and Zondek found the test positive in 98.6 per cent. In 470 controls they found no errors, and the cases of amenorrhea constituted the most important group. None of the 126 cases of amenorrhea gave a positive test. In one other test the physician had diagnosed pregnancy because of a missed period; the test was positive, but after a while the patient had some bleeding which probably was an early abortion. The reaction becomes negative about eight days after delivery but has been found positive on the ninth and on the twelfth day after abortion. It remains positive as long as living placental tissue is in biologic contact with maternal blood. Thus in tubal pregnancy one can expect a positive result only when the embryo is alive and not later than eight to ten days after its death. The results of 30 cases of tubal gestation were in conformity with the clinical and operative findings. The weakness of most tests for pregnancy is that other investigators do not obtain the same results, but the Ascheim-Zondek test has been used in 2,000 cases in the Frankfurt Clinic with 98 per cent accuracy, in Scheafer's Clinic at Charlottenburg in 100 cases with 98 per cent accuracy, in the Woman's Hospital of New York in 50 cases with one error. Using the Friedman modification, Reinhart and Scott reported results in 50 cases in which 49 were positive; Schneider reported 100 cases, 50 which were pregnant and 50 which were not. The results were exact in every case. Magath and Randall at the Mayo Clinic report 85 cases using the Friedman technic. Thirty-eight were pregnant and forty-seven were not. Their results also were exact in every case. In a personal series of sixteen cases, using the rabbit in four and mice in twelve, the results were all positive as checked by later clinical results. The rabbit is much the easier animal to obtain and use for laboratory purposes and most of the recent reports are with the rabbit as the test animal. Considerable work is being done using the male rat and Dr. Adair in Chicago reports excellent results with its use. The reaction consists of hypertrophy of the interstitial tissues of the testicle and of the seminal vesicles and the prostate.

Conclusions.—1. Pregnant women excrete large amounts of hypophyseal hormone in the urine.

2. Injections of urine from pregnant women into infantile mice leads to formation of corpora lutea and to hemorrhages in the ovary.

3. This reaction, the Ascheim-Zondek, is positive in 98 per cent of cases.

4. In tubal gestation and in abortion, the test is positive as long as living fetal tissue is in biologic contact with the maternal blood.

5. This test is also strongly positive in hydatiform mole and in chorionepithelioma, and in the latter is most valuable in determining treatment.

6. The writer makes a very earnest plea for the establishment of central stations where urines from pregnant women might be sent and the work done for a nominal fee, as is done in the British Isles, notably Scotland. The difficulties of obtaining laboratory animals and of technic are too great for the busy practitioner to cope with.

7. The test is a brilliant contribution to the field of diagnosis.

DISCUSSION

Dr. D. H. Bessesen said he happened to know that Dr. Leland had done all this work himself, and he felt the doctor should be complimented on the work. The analysis is these mice requires expert opinion but the rabbit is easier to work on. He felt it was splendid to have this laboratory procedure.

Dr. R. J. Moe (Duluth) stated that he had done twenty-five of these tests and he wished to call attention to the fact that there might be factors which would modify it. For instance, if one were testing a urine in which he might suspect the possibility of the presence of quinin, it is important to extract the quinin with ether. He had had one such case and so divided the urine into two parts and got a markedly positive reaction from the one without quinin in it and a negative reaction from the one with the quinin. There might be other things in urine, as acetone, which would modify the results of the test.

Dr. Leland replied that Dr. Moe's point is well taken. Zondek had the idea of a detoxifying agent, which is two to four times the amount of ether shaken with the urine. This reduced the mortality from 20 per cent in test animals to practically nil.

Dr. O. J. Campbell (Minneapolis) read a paper on "The Relation Between Cystic Disease and Cancer of the Breast."

The controversy over the relationship between cystic disease and cancer of the breast began with Billroth in 1880, when he wrote "Cancer does not originate in an otherwise normal breast." It has continued, so that even today opinion is for the most part divided into two groups.

One holds that cystic disease is definitely a pre-cancerous lesion and that the breast containing such a process should be removed to protect the patient against future cancer. The other group maintains that a breast in which cystic disease is present is no more likely to develop cancer than one which is entirely normal and, were it possible to diagnose the condition clinically, operation would not be necessary.

Two main lines of investigation have been followed by those who have contributed to these impressions: (1) microscopic study only, and (2) clinical follow-up of cases in which simple excision of part or all of the disease process has been done with preservation of the breast. Those following the first line almost always subscribe to the opinion that cystic disease is precancerous. Those following the second conclude that with certain exceptions cystic disease is not liable to malignant change.

Bloodgood followed 128 cases from which cystic disease had been excised or biopsied and found only three which developed cancer. Out of 107 such cases, Johnson found two cancers. In 1925, the writer followed cases operated at the University Hospital, in none of which had cancer subsequently developed. Since the incidence of carcinoma in these series was no greater than in normal breasts (about 2 per cent) the conclusion is almost inescapable that cystic disease is not a precancerous lesion.

Representing the other school of thought are such men as Ewing, Cheatle, McCarty, and Fitzwilliams, as well as older writers such as Brodie, Brissaud, Schimelbusch and others. Encountering in some forms of cystic disease a proliferation of atypical cells, mitotic figures, and even limited invasion, they interpret these as definite evidence of a malignant tendency on the part of the entire process and urge the removal of the breasts. Ewing finds pronounced pre-cancerous change in 50 per cent of cases of cystic disease examined by him.

Most of the confusion is caused by certain forms of the disease in which very marked epithelial proliferation has occurred. The best examples of this are the solid duct adenomas of Bloodgood, or the non-desquamative hyperplasia of Cheatle, intracystic papillomas and non-encapsulated cystadenomas.

These are the borderline cases over which pathologists disagree. Here the immediate question is not so much whether a precancerous condition exists but whether it is actually malignant at the time of the examination. That such lesions may give rise to malignancy is admitted by Bloodgood, who found that carcinoma developed in about ten per cent of papillomatous cysts and in even a higher percentage of non-encapsulated cystadenomas. Kilgore found carcinoma in four out of nine cases of non-encapsulated cystadenomas.

Where the diagnosis of cancer can be easily made in microscopic section it is interesting to note that the condition differs in no material way from other forms of carcinoma; that is, the clinical signs of malignancy are present and the axillary nodes are involved in a high percentage of cases by the time operation is performed.

On the other hand when the diagnosis is subject to disagreement it is noted that with rare exceptions the axillary nodes are free and recurrences do not follow, thus indicating that the lesions were either benign or at least of very low malignancy.

The surgeon placing the safety of his patient above all other considerations will be forced to do the complete operation on all doubtful lesions. Fortunately this group is small.

The evidence is strongly in favor of the view that except for the previously mentioned types in which epithelial hyperplasia so strongly dominates the picture, cystic disease is not a precancerous lesion.

Therefore, having established the diagnosis by exploration of the breast, the only danger encountered by the patient when the breast is preserved is that carcinoma, arising in a breast already the site of masses or nodules, may escape detection at its earliest and most favorable period. It would, however, be recognized when the clinical signs of malignancy are present. A rather remote danger is that, even removing the most suspicious area of a breast, an early carcinoma present in some other portion may be missed. These small compromises with safety seem justified in order to avoid the unnecessary removal of a large number of breasts. Where exploration reveals multiple intracystic papillomas or diffuse non-encapsulated cystadenomas, it may be wiser to remove the entire disease process even though it includes simple amputation of the breast.

Dr. A. A. Zierold (Minneapolis) read a paper on "Acute Cholecystitis" (to be published in full later).

ABSTRACT

Review of the literature discloses wide variance of the treatment of acute cholecystitis. This is chiefly the result of confusion of terms and absence of correlation between clinical and pathological findings. The term "acute cholecystitis" is commonly used to identify the gross appearance of the diseased gallbladder as characterized by edema, dark red hemorrhagic walls, with or without fibrinous exudate. Study of a series of sixty cases removed at operation tends to show that this condition is invariably accompanied by occlusion of the cystic duct with an impacted stone. As a result of this, obstruction of the veins and lymphatics occurs and acute edema follows. Inspection of the gallbladder wall, four to six hours after onset, reveals edema of the wall but no evidence of cellular invasion. Sections of the specimen removed twenty-four or thirty-six hours following onset show edema and round cell infiltration. This progresses to a maximum at seven to eight days, after which the process tends to recede. At the end of three or four weeks, the gallbladder returns to the condition at the time of onset, and shows no evidence of recent inflammation save some interstitial edema. At onset, the gallbladder content is sterile but as the condition progresses it may become infected and the return to normal be delayed. The term acute cholecystitis is commonly used to indicate a progressive change beginning with acute passive congestion of the gallbladder wall followed by leukocytic invasion and terminating in a return to the original state or hydrops of the gallbladder.

DISCUSSION

Dr. V. S. Counseller (Rochester) said these cases, which are extremely interesting ones, are difficult surgical problems from the onset. It is important to differentiate between the two types mentioned by Dr. Zierold because the dangers of perforation in the first group far exceed those of the second. Fortunately, the acute perforating gallbladder is seen less than the acute gallbladder following cystic duct obstruction. The management and course of the acute perforating gallbladder have been accurately and clearly set forth by Dr. Zierold. Dr. Counseller said he is more concerned at the moment with the acute gallbladder following stone in the cystic duct, for in many instances cholecystostomy is performed instead of cholecystectomy. He felt that cholecystectomy can always safely be done after the fever has subsided. It is his cystom to treat this group conservatively until the temperature has been normal for four or five days; cholecystectomy can then be performed safely. That cholecystectomy can be done safely is substantiated by the fact that all of these patients have an exceedingly normal convalescence. If one has diagnosed perforation of the gallbladder, it is best to establish drainage under local anesthesia with as little manipulation as possible; further treatment to be directed toward support of the patient. The principal point in Dr. Zierold's paper which Dr. Counseller wished to emphasize is that it is especially important to distinguish between the acute perforating type of gallbladder and the acute type following cystic duct obstruction because the surgical management and prognosis may be distinctly different.

Dr. Harold Leland (Minneapolis) read a paper on "Estimation of Disabilities for Industrial Purposes."

Recently there has been a definite step forward toward standardization of estimates of disabilities in industrial cases with several carefully planned schedules recently printed. There, of course, will probably always be differences of opinion as to the value of complete or partial loss of function of any given part of an extremity, at least until a more detailed standard is agreed upon by our Industrial Commissions. There is, however, no valid excuse for the large variations in estimates that are too frequently encountered. It is not necessary to dwell on the fallacy of pitching estimates low for purposes of effect in treated cases, or of making high estimates with the view of arriving at a compromise settlement. The purpose of this paper is therefore, not to particularly attempt to present any new schedule of rates or new methods but rather to explain certain fundamentals which might not be clear to all of us and which might guide our best judgment along uniform lines.

The Minnesota Compensation law describes a temporary disability and a permanent disability. Temporary disability refers to the time of healing following an accident and allows the man two-thirds of his weekly salary up to $20 a week, for a healing period of twenty-five weeks, after which his compensation comes out of his estimated permanent disability. The limit of such disability is 300 weeks. Occasionally where a man is partially disabled and not receiving full wages, two-thirds of the difference between his present and normal wages will be allowed.

Before going into the matter of permanent disabilities, let us consider for a moment the conditions which entitle a workman to receive temporary or permanent disability. In the first place, an accident has to occur which can plausibly account for the symptoms and disability present. On first consideration, this would seem to be simple, but remember that patients will frequently and conscientiously ascribe an illness or symptoms of a disease process to some accident or effort. Workingmen are becoming more and more educated to the fact that they have to have an accident in order to be entitled to compensation. Our most careful discretion must, therefore, be used in deriving the actual cause of an illness or disability upon which we can positively state whether or not a condition is due to disease or accident. Compensation insurance is not health insurance.

There are only certain designated occupational diseases which are compensable under the Minnesota Law. These are twenty-three in number, specifically described, and include such diseases as anthrax, lead poisoning and several similar chemical poisons; epitheliomatous cancer due to tar, pitch, etc.; glanders; compressed air illness and various conditions arising among miners, and cataract arising in glass blowers. It would be well to remember that aside from these specified diseases a disability has to have a specific accident as a causaive or aggravating factor to allow compensation.

In estimating permanent disabilities, it is necessary o understand that the Minnesota Law has placed cerain valuations in weeks of compensation on specified units of extremities and estimates have to be made accordingly. For example, a leg or an arm is valued at 200 weeks of compensation or, in other words, the oss of an arm or leg would entitle the individual to 200 weeks of his regular compensation after his healing period has terminated and regardless of whether or not he is working. The next smaller unit is the hand and wrist, which is valued at 175 weeks, or the foot and ankle, which is valued at 150 weeks. The hand alone is valued at 150 weeks, and the foot alone at 125 weeks. The value of the thumb is 60 weeks, the ndex finger 35 weeks, the middle 30 weeks, the ring 20 weeks and the small finger 15 weeks. The value of the great toe is 30 weeks, and each of the other toes 10 weeks. In estimating disability, therefore, we have to specify the percentage of the smallest unit involved. If an index finger is involved, the disability should be made as the percentage of permanent disability in this finger. If the metacarpal-phalangeal joint is involved, or any part of the hand not including the wrist, it should be made as permanent disability of the hand not including the wrist, and so on. No provisions are made under the Minnesota Law for estimating disability on the back. It should also be remembered that estimates under the Minnesota Law are made with regard to general usefulness without any relationship to any particular occupation. The basis of disability estimates should be the same, therefore, for all types of workmen.

In keeping with the purpose of this paper, the following schedule is not used with the purpose of giving a detailed schedule of disabilities for various types of loss of function in any one joint, but rather as a general guide to which one's judgment can be applied in any one case. The simpler the method of application, the better for the average individual inasmuch as the usual disability will be based on a combination of factors that in themselves might be complicated and confusing. The following schedule, therefore, is based on the loss of joint movements, so that we have an average normal value of any one joint. It is then comparatively simple to arrive at an approximate estimate by comparing the movement lost with the normal arc, the value of which we have established. The matter of ankylosis in a joint can be obtained fairly accurately from these figures, raising or lowering these figures according to whether the position is good or bad. The basis of comparison of normal function should be the opposite normal extremity and all angles should be accurately measured. For this purpose an ordinary carpenter's angle rule is sufficient. Also it has to be borne in mind that certain portions of the arc of motion are more valuable than others and that this might modify our estimates.

The value of the loss of joint movements is, therefore, approximately as follows. To avoid confusion, no attempt is made to give values of different types of ankylosis which are encountered comparatively infrequently.

UPPER EXTREMITIES

Shoulder movement	
Arm at side	75% of arm
From horiztontal to vertical	30% of arm
Elbow movement	
Good position otherwise	60% of arm
Pronation and Supination	
Neutral position	25% of hand and wrist
Wrist movement	
Dorsiflexion and palmar flexion, radial and ulnar deviation	35% of hand and wrist
Thumb	
Interphalangeal joint	50% of thumb
Metacarpal phalangeal joint	25% of hand
Fingers	
Proximal interphalangeal joint	60% of finger
Distal interphalangeal joint	40% of finger
Metacarpal phalangeal joint	Depends on finger and based on percentage of hand.

In testing movements of the fingers, we make it a rule if possible to hold the metacarpal phalangeal joint in a normal right angle flexion, which transmits the limitation to the interphalangeal joints and makes estimation easier.

LOWER EXTREMITIES

Hip joint movement	75% of leg
Knee joint movement	60% of leg
Ankle joint movement	35% of foot and ankle
Subastragaloid joint movement	35% of foot
Great toe, interphalangeal joint	25% of great toe

These figures frequently will have to be modified where other factors have to be taken into consideration, such as the involvement of multiple joints, associated amputations, nerve injuries, loss of strength, and the like. In the case of the lower extremities, particularly the knee, the loss of motion frequently is not as important as instability of the joint. Here, too, pain frequently has to be considered as, for example, in fractures of the os calcis. Shortening, which would play no material part in the upper extremity, would have to be considered in the lower extremity. A shortening of one inch would cause no disability; of one to two inches, 10% to 20% loss of the leg, and two to three inches, 20% to 35% loss of the leg.

Amputations have specified values according to law. The loss of one and a half phalanges or more in a finger or toe constitutes the complete loss of that finger, or toe. The amputation of the arm below the elbow constitutes the loss of the hand and wrist if enough of a stump is left to allow the use of an artificial limb. The loss of a leg so close to the hip that no artificial limb can be worn constitutes the total loss of the leg; if an artificial limb can be worn, 175 weeks is specified. Amputation below the knee with sufficient stump is valued at complete loss of the foot and ankle.

These facts are submitted with the knowledge that the figures quoted are subject to individual opinion and might justifiably be changed. Our purpose has been merely to outline a consideration of industrial disabilities which might be helpful to those who have not had the opportunity to familiarize themselves with the Minnesota Compensation Law.

The meeting adjourned.

D. G. Gardiner, M.D., *Secretary.*

McKESSON'S COPPER-IRON COMPOUND NOT ACCEPTABLE FOR N.N.R.

The Council on Pharmacy and Chemistry reports that McKesson's Copper-Iron Compound was presented as being of value in the treatment of anemia, with the statement that it contained copper caseinate 2.565 Gm., iron peptonate 5.700 Gm. in a menstruum of alcohol, glycerin, water and flavoring material to make 1,000 c.c. The Council examined the submitted evidence and found it insufficient to warrant recognition of a copper-iron preparation for widespread clinical use. Since McKesson and Robbins have not submitted acceptable evidence to show that its copper-iron preparation is superior to the iron preparations in current use, the Council declared it unacceptable for New and Nonofficial Remedies because of unwarranted therapeutic claims. (Jour. A. M. A., December 26, 1931, p. 1967.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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MEDICINE

THE DETOXIFICATION OF COCAINE, PICROTOXIN AND STRYCHNINE BY SODIUM AMYTAL: E. E. Swanson (Jour. Lab. and Clin. Med., 17:325, January, 1932). The purposes of this investigation are to ascertain definitely in experimental animals (rabbits): (a) Whether or not sodium amytal detoxifies the convulsant drugs which act on the parts of the central nervous system other than the cerebrum; (b) whether or not sodium amytal affords greater protection against poisoning by intravenous than by oral administration; and (c) the efficiency of sodium amytal in preventing the occurrence of convulsions inducted by these drugs. Picrotoxin and strychnine were selected for investigation, since the former is known to cause convulsions chiefly by the stimulation of the medulla, and the latter by that of the spinal cord. Cocaine, which is known to produce convulsions by its action on the cerebrum, was also studied under the same conditions for comparison.

The study revealed that sodium amytal detoxifies each of these three poisons. The detoxifying value of sodium amytal is greater when it is administered intravenously than orally. The difference between the two routes of administration is striking with cocaine and strychnine, but relatively less so with picrotoxin. When administered subcutaneously and intramuscularly with picrotoxin and strychnine the protective action of sodium amytal is even greater by vein or mouth. Subcutaneous and intramuscular injection of the drug, however, does not detoxify cocaine.

The administration of sodium amytal increases the dose of cocaine, strychnine, and picrotoxin required to cause convulsions, and also tends to lengthen the time required for convulsions to appear following the administration of these poisons. The intravenous administration of sodium amytal, being rapid in its effect, is of greatest value in cases of cocaine poisoning, since this drug produces convulsions very soon (three minutes) after administration. The oral administration of sodium amytal gave greater convulsant protection for picrotoxin and strychnine (poisons which produce convulsions twenty minutes after administration) apparently because of more prolonged and equal rate of the development of their effects. Sodium amytal, therefore, is an anticonvulsant as well as a detoxifying agent for these three poisons.

C. A. Stewart, M.D.

PEDIATRICS

EVAPORATED MILK IN INFANT FEEDING: Charles Gilmore Kerley, M.D., New York (Arch. of Ped., Vol. XLIX, No. 1, January, 1932): For the vomiting infant, for whom the thick feeding plan is employed, the author finds evaporated milk cooked with farina gives better results than when fresh milk is used; the satisfactory results of its use in the premature gives striking proof of its adaptability in subnormal infants.

During the process of evaporation certain changes take place in the milk which make it easier of assimilation. The finer division of the fat globules and a change in structure of the protein content by means of the homogenizing process doubtless explains in part this feature.

Regardless of the nature of the change, it has been clinically demonstrated that when given in connection with orange juice it supplies the most satisfactory substitute for human milk available at the present time in the routine difficult bottle feeding case.

For those that are ill from a digestive standpoint, in cases of maltnutrition and marasmus, those who vomit habitually and those with a tendency to looseness of the bowels, evaporated milk is employed, for the reason that it requires about 50 per cent less digestive effort than does fresh cow's milk. In food value one ounce represents a trifle over two ounces of fresh cow's milk. For purposes of better assimilation in some cases the starch is cooked with a designated quantity of milk and water for one-half hour in a double boiler; milk sugar is added after the completion of the cooking. The starch used is a baked flour of either barley, wheat or oats.

In the use of evaporated milk in athreptic babies, cod liver oil in small doses and orange juice are always given provided the child can take care of them. Neither are used if they influence unfavorably the food intake, appetite, or the nature of the stools.

Evaporated milk is always used to supply the milk content in thick gruel feedings. In these cases, in addition to the vomiting, there is always a lessened digestive capacity and the author has found that the child thrives best when the evaporated product is used. In beginning its use in the marantic child, it is rarely wise to use a stronger mixture than six ounces to 24 ounces of diluent. Clinically, 12 ounces of evaporated milk appears to possess the value of 30 ounces of fresh milk.

R. N. Andrews, M.D.

FIELD TREATMENTS OF ASCARIASIS, AN-YLOSTOMIASIS, AND TRICHURIASIS WITH IEXYLRESORCINOL: P. D. Lamson, H. W. Brown, . H. Robbins and C. B. Ward (Am. Jour. Hyg., XIII: 803-21, May, 1931). This study was prompted y the real need for a safe and effective ascaricide. fter trying out the various phenol derivatives, the uthors decided upon hexylresorcinol as the most ef-ective and least toxic. The drug was administered in ie crystalline form in hard gelatine capsules, a single ose of 1 gram being given orally upon a fasting stom-ch. The patient took the capsule upon rising and ontinued to fast until noon. A purge of magnesium ulphate was given after twenty-four hours. Experi-ients showed that hexylresorcinol in an oil solution, s caprokol, did not kill the ascarids; in water, it is nly slightly soluble, very unpalatable and irritating. 'he authors now report the results of field treatments n 1,500 individuals.

From 90 to 100 per cent of the worms were re-ioved by a single dose. The degree of success in the idividual case was largely dependent on the coöpera-on of the patient. Where the experiments could be erfectly controlled and the patient was starved for ighteen to twenty-four hours, 100 per cent cures were ossible, but where the children were allowed to eat iortly before the treatment, results were not so good nd there was some vomiting. This was attributed to ie fact that hexylresorcinol combines quite readily 'ith protein when present in the gastro-intestinal tract. xperiments with different amounts of the drug iowed that best results obtained with a dose of 1 ram for patients over twelve years, 0.6 to 0.8 gram to iildren from six to eight years and 0.4 gram to young-r ones. A repeated dose did not produce any better esults than a single one. Of those treated, 530 also ad hookworms, and these were reduced by 80 to 89 er cent; when a double dose of 0.6 grams each was sed, there were 88 per cent of cures. Some success in 'eating trichuris is also reported incidentally. The uthors are still seeking a method of putting up hexyl-esorcinol in stable form for clinical use, since the rystals react with gelatine after a while, thus ren-ering the drug unstable.

L. G. Frary, M.D.

GOLD TRIBROMIDE (AURUM TRIBROMI-UM) IN THE TREATMENT OF PERTUSSIS: . Epstein, M.D., New York (Arch. of Ped., Vol. LIX, No. 1, January, 1932): To witness a child dur-ig an attack of whooping cough is to be convinced of ie importance of some reliable drug which will alle-iate the spasmodic violence. Of all the drugs used or the relief of pertussis, the bromides give better esults than any of the other drugs. In observing the ction of the bromides in pertussis, the author was im-ressed with the fact that the bivalent bromides have reater sedative effect than the univalent bromides, and is therefore reasonable to assume that the trivalent romides would give greater sedative action than either f the others.

Gold tribromide was used by the author in a series f cases. Treatment consisted in the administration by iouth of a solution of the tribromide. The dosage aried with the age and weight of the child and the se-erity of the paroxysmal cough. As a general rule /20 to 1/10 of a grain, three times a day, was given. i very young children, 1/30 of a grain, three times a ay, was found sufficient to control the cough.

The result with gold tribromide in the 30 children 'as most gratifying. In two or three weeks the cough eased entirely. In the 15 children who received the sual antipertussis remedies, the cough was frequent nd racking, and the course of the disease was long, arying from three to four months.

Gold was used in medicine in remote ages. The medicinal effect of gold tribromide is probably due to a specific chemical combination of gold with bromine. The compound of gold tribromide inhibits motor and reflex irritability and causes a general sedative and antispasmodic action. For therapeutic purposes it is sufficient to know that gold tribromide shortens the period of the illness, reduces the number and severity of the paroxysms and gives the child rest and sleep.

R. N. Andrews, M.D.

ROENTGENOLOGY

TUBERCULOUS ATELECTATIC CIRRHOSIS OF THE LUNG—ITS ROENTGENOLOGIC SIGNIFICANCE: Karl Kornblum, M.D., and Richard T. Ellison, M.D. (The Amer. Jour. Roentg. and Rad. Ther., Vol. XXV, May, 1931, Pp. 620-628). In this article, the author calls attention to atelectatic cirrhosis of the lung as a lesion that may develop in the course of healing in tuberculosis.

He then reports two cases in which this lesion was the only manifestation of the disease and two other cases with the serial roentgenological findings showing the development of these lesions.

The underlying pathology is discussed. This begins with healing, the laying down of fibrous connective tissue. This tissue is deposited about the lesion and includes in it the bronchioles and bronchi. Then as healing progresses, there is a contraction of the fibrous tissue, which results in a choking of the bronchioles. This leaves an unaerated portion of the lung in the region of the lesion, and then the lung contracts and leaves a dense area, which in the roentgenological examination one finds in the lung field. If in the upper lobe, one may find the dense area and evidence that it is pulling the mediastinal contents and trachea towards it. This occurs when pleural adhesions are present. If there are no pleural adhesions present, the shifting does not occur but the space left by the contraction of the diseased area is filled in by emphysematous lung tissue. In this case, the hilus on the side affected is pulled up higher than the other hilus.

If the lesion is in the lower lobe, the diaphragm is elevated. If in the middle lobe, on the right side, there may be no change except emphysema. This condition has to be differentiated from such conditions as tumors of mediastinum, exudative and infiltrative lesions of lung parenchyma, such as unresolved pneumonia, or malignant growths, and atelectasis from complete bronchial obstruction by endobronchial lesion or foreign body. Physical examination is of little value in detecting it.

Sputum examination is commonly negative. Bronchoscopic examination may aid in the diagnosis.

Atelectatic cirrhosis is, the author thinks, more common than is realized, and may be the only evidence of tuberculosis. The disease may follow such a benign course that a history of illness is not obtained. It is always well for one to keep tuberculosis constantly in mind when making a diagnosis from X-ray films.

J. J. Rouse, M.D.

"INFRA-RED"

Under the incorrect and confusing name, "Infra-Red," the Iodine Products Co. of Caney, Kansas, describes an office test to determine the degree of acidosis. The designation, "Infra-Red," is applied to a "super-alkalized iodide." This test can do no more than determine the titratable acidity of the urine. However, this is not the method of choice in measuring the development of an acidosis. (Jour. A. M. A., January 2, 1932, p. 71.)

BOOK REVIEWS

COURTS AND DOCTORS: Lloyd Paul Stryker (formerly General Counsel for the New York State Medical Society). 236 pages, $2.00. New York: Macmillan, 1932.

This book presents in a concise and clear-cut manner the various aspects of the law as applied to medical practice. It is particularly valuable in laying down fundamental principles, both in avoiding and in defending law-suits, citing the best judicial opinion in defining the physician's rights. A particularly optimistic feature is the author's frequent proof that judges in their opinions are zealous in their efforts to help the physician so that he may practice, using his own best judgment, without fear of the intolerable bogey of unwarranted law-suits.

It is a valuable book and its reading will fortify the practitioner with clear-cut knowledge of his rights and his limitations.

C. H. Mattson, M.D.

RESEARCH COUNCIL BULLETIN 83.—STATUTE LAW OF CORONERS AND MEDICAL EXAMINERS IN THE UNITED STATES: George H. Weinmann, LL.B. 240 pages, $3.00. Washington: National Research Council, 1931.

As the title states, this bulletin is a compendium of the Statute Law of Coroners and Medical Examiners in this country. The mode of selection, qualifications and tenure of office of the Coroner are first considered; then the matter of deputy coroners. The powers and duties of the coroner in general, and most particularly as to inquests, are taken up in detail. Th statutes concerning compensation and fees are ther listed, and finally the laws relative to medical examiners (in the few states in which such officials exist) are recorded and discussed. The statutes of each stat and territory are listed, and leading cases are cited fo the questions of law considered.

No attempt is made to suggest reforms or to giv the relative value of the coroner and medical examine systems.

It is good as a reference book, and represents muc careful work.

Walter P. Gardner, M.D.

MEDICAL JURISPRUDENCE: Alfred W. Herzog Ph.B., A.M., M.D. 1,051 pages. Price, $15.0 Indianapolis: Bobbs-Merrill Co., 1931.

This is a well arranged and very inclusive work, intended for the use of both lawyer and physician. feel that the author is justified in his introductor statement that this book "will function as a guide boo to medico-legal knowledge."

The chapters are divided into sections replete wit references to footnotes, wherein ample and detaile references to cases are given, so that a thorough discussion of any point of law may be easily located.

A partial bibliography of pertinent medical works i appended to aid the lawyer, in securing more detaile information on medical subjects.

I feel that this is a book well worthy of a place i the libraries of lawyers and physicians.

Walter P. Gardner, M.D.

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YOUNG LADY TECHNICIAN desires position i Clinic, Hospital, or Doctor's office. Experienced i X-ray, Physiotherapy, and all clinical laborator procedures. Also experienced in nursing and bookkeeping. Can furnish A-1 references. Address D 168, care Minnesota Medicine.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XV MAY, 1932 No. 5

COMPULSORY SICKNESS INSURANCE*

JAMES S. GILFILLAN, M.D.
Saint Paul

THE subject of compulsory sickness insurance has for a number of years attracted considerable attention, both in the medical profession and among the laity. Numerous articles on the subject have appeared in our journals and many lay magazines. The presidential address before the American Medical Association, in 1930, by Dr. Morgan, considers the subject quite thoroughly.

In 1917 the "American Association for Labor Legislation" caused to be introduced in legislatures of twenty-two of our states a bill which provided for the compulsory insurance of all employees. The state was to pay all administrative expenses, the balance to be divided equally between the employers and employees and the benefits were as follows:

1. A certain proportion of wages paid during disability.
2. Medical and hospital care, drugs, etc., for insured and family.
3. Expenses of rehabilitation.
4. Dental care.
5. Burial allowance.

These bills all failed to pass.

The great majority of these articles and discussions, however, are controversial in character, the writer or speaker considering the subject from his own point of view.

It appears that the subject is a live one and the medical profession should be informed on the subject. It may be that there is little probability of such a system being adopted in our country in the near future but it is, I think, sure to be proposed and seriously considered at some time. When this time comes the united profession should be ready to combat it if this should be thought wise, but especially to direct the legislation and gain as much influence as possible in the direction of the plan if it becomes inevitable.

In the present paper there is no argument for or against the system, but an attempt is made to show briefly its methods of application and, so far as possible, effect on the economic situation of the medical profession in some of the countries in which it is in operation.

First let us review a few statistics having to do with the general economic conditions as related to the cost of sickness in this country. The following table shows the estimated amount expended for this purpose.

150,000 physicians, at $3,000 per annum	$ 450,000,000
140,000 private duty nurses, at $1,500 per annum	210,000,000
150,000 practical nurses, at $1,000 per annum	150,000,000
100,000 attendants, at $1,000 per annum	100,000,000
50,000 dentists, at $3,000 per annum	150,000,000
7,000 hospitals, with total of 860,000 beds	750,000,000
Druggists, for medicines	700,000,000
25,000 healers, chiropractors, osteopaths, Christian Scientists, etc., at $2,000 per annum	50,000,000
Grand Total	$2,560,000,000

Of this amount about $800,000,000 is not paid directly by the recipients of the service but is contributed by government agencies, charity, etc.

For comparison the following national expenditures are given:

Jewelry	500 Million
Autos and parts	2 Billion
Candy	1 Billion
Perfumes and cosmetics	750 Million
Musical instruments	250 Million
Chewing gum	50 Million
Cigarettes	800 Million
Tobacco and snuff	800 Million
Cigar and cigarette holders	1 Million
Alcoholic beverages (Association Against Prohibition Amendment)	3 Billion

The total cost per individual then is about $21.00 or approximately $100.00 per family.

The average wage earner's family pays about

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*President's Address before the Minnesota Academy of Medicine, January 13, 1932.

$60.00 a year, farmers about the same, for medical service. The total income of the United States is about $90,000,000,000.00. Incomes of families in 1927 were classified as follows:

6 per cent of families	over $2,900.00
90 per cent of families	under 2,000.00
67 per cent of families	under 1,450.00

The following shows the number of those employed in the care of the sick:

	Enumerations	Estimates
Physicians	143,000	
Attendants of physicians		24,000
Dentists	67,334	
Dental hygienists		1,800
Dentists' assistants		12,000
Dental technicians		10,000
Physiotherapists	500	
Osteopaths	7,602	
Naturopaths		500
Electrotherapists		300
Chiropractors		15,000
Christian Science practitioners	8,500	
Trained nurses		200,000
Practical nurses	151,996	
Midwives		55,000
Hospital superintendents (not included above)	2,600	
Hospital personnel (not included above)		550,000
Clinic attendants (not included above)		5,000
Optometrists and opticians	18,079	
Chiropodists and podiatrists		7,000
Masseurs		3,000
Pharmacists		100,000
Drug clerks and assistant registered pharmacists		84,000
Health department personnel (not included above)		11,500
Clinical laboratory personnel		1,400
Personnel of private health organizations (not included above)		1,000
Totals	399,611	1,081,500
Grand total		1,481,111

In the United States there is one physician to every 753 people, a higher proportion than in any other country.

The proportion in some of the European countries is as follows:

Switzerland	1 to 1,250
Denmark	1 to 1,430
England and Wales	1 to 1,490
Germany	1 to 1,560
France	1 to 1,690
Netherlands	1 to 1,820
Sweden	1 to 2,860

Distribution in the different states varies from one to 1,386 in North Dakota to one to 465 in California. The number of physicians employed full time on a salary basis is estimated to be 11 per cent. There are about 7,000 hospitals with a total of 853,000 beds. More than 50 per cent of these are supported by Government agencies and 25 per cent by non-profiting organizations.

Following the industrial revolution in the latter part of the 18th century and under the laissez faire economic system the condition of the working classes became desperate. The state made no attempt to alleviate their distress, trade unions were forbidden and employers were free to oppress their employees without interference on the part of the government.

About the middle of the 19th century some employers, prompted by their own interest or more humane motives, began to take an interest in the welfare of their employees and organized numerous institutions and funds for their relief. These efforts were unsatisfactory and opposed by the socialists on the ground that through them the laborer became more dependent.

Gradually laborers came to look upon themselves as a class opposed to the employers. More concerted action became possible, pressure could be brought on the authorities and the right to establish associations for mutual protection was obtained. So mutual aid societies and the friendly societies of England were established and spread over the continent, usually connected with trade unions.

This movement, however, remained limited and the organizations were apt to be weak financially, due to small membership, etc.

In time, the power of the labor vote being recognized, the authorities gave such societies a special status and even financial assistance. In consequence of this, societies multiplied and membership increased, but owing to multiplicity of organizations, small means, etc., were never entirely satisfactory.

A plan of compulsory sickness insurance was considered by the French convention in 1794 but never put in practice. Germany, in 1883, instituted the first compulsory sickness insurance system. This was apparently a political subterfuge on the part of Bismarck, directed against the socialist movement and the numerous trade funds which might be used in any disagreement with the State. For this reason it was opposed by the working classes. Since then the following countries have adopted this form of relief:

Austria and Hungary in	1888
Luxemburg	1901
Norway	1909
Serbia	1910
Great Britain	1911
Russia	1911
Roumania	1912
Bulgaria	1918

Portugal	1919
Czechoslovakia	1919
Poland	1920
Greece	1922
Japan	1922
Chile	1924
Lithuania	1925

France has just accepted the plan and Australia, South Africa and Brazil have the matter under consideration.

In the various countries now utilizing the system there are, of course, great differences in the scope, limitations, source of contributions, etc.

In the beginning, insurance was as a rule limited to wage earners in industry and commerce. As a rule it has gradually extended to include other employments, as agriculture, domestic service, home workers and, in some instances, to independent workers of limited means. It now includes the family of the worker in the majority of countries. In some countries the liability to insurance is confined to those whose income is below a certain amount; in others the income is not considered. Where there is a limit it usually applies only to non-manual workers. Thus in Austria, Czechoslovakia, Poland, and Russia there is no limit. The following table shows the limit in some of the countries in which it applies:

Country	Class of worker	Source of income	Maximum rate
Germany	Non-manual	Earned	3,600 marks ($900)
Great Britain and Northern Ireland	Non-manual	Earned	£250 ($1,250)
Hungary	Non-manual	Earned	24,000,000 crowns ($340)
Irish Free State	Non-manual	Earned	£250 ($1,250)
Japan	Non-manual	Earned	1,200 yen ($600)
Lithuania	All	Earned	4,800 litas ($480)
Luxemburg	Non-manual	Earned	10,000 francs
Norway	Non-manual	All	6,000 crowns ($1,600)

Once established, the tendency is to increase the scope of insurance. Beginning with wage earners whose income is below a certain maximum, this maximum is apt to be increased or done away with. The dependents usually are included and the medical care is extended to include hospitalization, specialists, dentists, sanatoria, more costly methods of treatment, etc. Usually special benefits are allowed to women for care before, during and after childbirth with often an addition in case the child is nursed. In addition, efforts are made towards the prevention of disease, especially tuberculosis and venereal diseases. Advice on housing conditions, etc., is often given. Ordinarily there is a cash benefit to partially cover loss of income during the illness. Often an allowance for funeral expenses is made.

When a law providing for compulsory insurance is adopted, some provision must be made for the management and application of the system. It is rare for the state itself to undertake this. At present only Bulgaria has a system in which this is done. Ordinarily the insurance is carried by societies which have been in existence previous to the passage of the act or which are later formed for this purpose. The government, however, must approve of the institution, which must conform to the provisions of the law regarding rates of contribution, benefits, etc. The state usually demands that the society does not do business for a profit, must have a minimum membership and reserve fund, and that the insured have a voice in the management. It must provide an opportunity for all to secure insurance. The societies are as a rule managed by the insured and employers, with, at times, representatives of the state.

The insurance group may be composed of those in the same occupation, as a trade union or all the employees of a business. It may be territorial, including all insured in a district, or it may be a mutual group of any kind. As a consequence there is much duplication of work and an unnecessarily high overhead expense. Some funds operate under more favorable conditions and are able to give extra benefits. Others are apt to be unstable as they are dependent on conditions in a certain trade or single undertaking. Many have too *small* a membership. There is a tendency for the number of funds to diminish through consolidation. At present Germany and Great Britain each have about 8,000 authorized funds.

In Poland, where after the war complete reorganization was necessary, territorial funds were established. Each covers an administrative district or large city and all insured residents of the district are compelled to join the same society. This is a much simpler plan than is usual and there are less than 200 organizations in the country.

The act which establishes the system specifies the source of the necessary contributions. These may be made by the insured, by the employers, by the state or by two or all of these.

In Russia the employer alone pays; in other countries the insured has to bear part of the expense; in Roumania all. In some of the Swiss cantons the cost is borne by the insured and the state, the employer not participating. Usually the insured and employers contribute about equally.

Individual share in contributions may be uniform, as in Great Britain. Here everyone pays the same, irrespective of risk or earnings. Usually the insured are graded according to their earnings, those receiving higher pay being assessed in proportion. Sometimes the assessment varies with the amount of risk.

The minimum benefit to which the insured is entitled is set by law. When an insurance fund is able, it may grant additional benefits.

The rate of money benefit may be the same for all, as in Great Britain, or may be graded according to the wages of the individual, as in most other countries. It usually amounts to 50 or 75 per cent of the wage, rarely to 100 per cent (*e.g.* Russia). In some instances the rate is greater for married men.

In order to claim benefits the insured must be unable to work on account of sickness. Usually the first three or four days are not covered by the insurance; thus brief illnesses are excluded. The duration of benefits varies in different countries from three months to a year. After this period the individual may be protected by an invalidity insurance, distinct from sickness insurance. If hospital treatment is provided, usually the cash benefit is reduced during the time the insured is in the hospital.

In addition to the cash benefit all countries except the Irish Free State provide medical care for the insured, which ordinarily includes drugs and curative appliances. In many countries hospital treatment is also given.

All laws specify that the medical treatment provided must be given by those legally qualified to attend the sick. Usually the insurance institution selects doctors according to some definite method. Treatment by specialists and dentists may be included or not. As a rule the patient is required to visit the doctor's office at certain hours, except when the nature of the case prevents. Drugs and appliances are provided under the majority of schemes, but every effort is made by the funds to keep down expense by supervision of prescribing. Hospital treatment is not compulsory but is given in many countries. Home nursing is usually not provided.

The organization of medical service is usually entrusted to the insurance organizations, with certain legal restrictions. In Great Britain, however, it is in the hands of the insurance committees, which are public bodies selected by the insured, the local doctors and the authorities. In some of the Baltic States the employer is responsible and in Russia the public health authorities.

There are three main systems of medical selection:

1. Any qualified doctor may apply for inclusion on the list. This application gives him the right to treat insured persons. The patient may choose any doctor on the list. There has been much controversy about this free choice, the medical profession usually favoring it, the societies often wishing to restrict it.

2. The number of doctors is limited according to the number of insured. Here the freedom of choice on the part of the patient is also limited.

3. The fund appoints one or more doctors in a locality, on full or part time, and the insured has no choice.

Doctors claim that a patient has a natural right to choose any doctor he wishes and that the society has no right to prevent this choice. The funds claim that an insured person has not this right, as he does not pay directly for the service, and for reasons of economy and simplicity prefer to do business with as few as possible.

Freedom of choice is also objected to on the ground that many persons will go to the physician who most readily grants disability claims.

Medical practitioners are not compelled to accept insurance patients. The organization of the service depends on contracts with the profession. In some countries the terms of the contract may be defined by law; in others the parties are allowed to come to any agreement they see fit.

At present in most countries the contract is made with a national medical society or some other body representing the doctors. Individual contracts are based on these. The situation of the medical profession usually depends on how well organized it is and how soon it unites on its demands after the institution of the system.

The remuneration of the medical profession is naturally one of the principal grounds of contention between the doctors and the funds or authorities. The method of remuneration varies and there are often several different methods in force in the same country.

1. A doctor may be paid a fixed salary. This is more usual when employed for full time but may be for part time.
2. Payment consists of a certain amount per insured person, irrespective of the amount of work done. The fee is based on the morbidity rate. This is the Panel System of Great Britain.
3. There is a fixed fee for each case of sickness, not depending on its severity or duration.
4. The fee is paid according to attendance. Usually a unit of attendance is chosen and for different services multiples of this unit are allowed. This is the plan usually favored by doctors.

In a few countries (*e.g.* Norway) the doctors do not accept a fee set by the funds. They make their own charge, which is ordinarily governed by a schedule agreed upon by the medical society. If this is greater than the amount allowed by the insurance society the patient is expected to pay the difference. This is not satisfactory to the insured and there are often difficulties in collecting.

It is rather difficult to estimate the effect of insurance on the medical profession. Nearly everywhere there is continual dissension between the doctors and the societies or government, but, so far as I am able to ascertain, in no country in which the system is in force is the profession in favor of giving it up. The complaints are rather directed against certain features of its administration.

The first item of contention is the amount received by the doctor for his services. Although in most, if not all, of the countries, the total income of the profession is greater than it was or would be without insurance, this cause of dissatisfaction is always present and probably never can be removed. Connected with this is the tendency to handle too many patients in a superficial way. Where the capitation fee is in force it is said that patients receive too little attention; where the payment is for work done, too much.

The freedom of the physician is, of course, restricted more or less. He must give notice of absences and provide a substitute and his prescribing is to some extent under supervision. At times there may be an investigation of his cases to determine whether his certification of disability is justified. The dissatisfaction of a patient may bring him before a lay body for trial.

A common complaint is the amount of work necessary on records, certificates, etc. This consumes much time and is usually not paid for aside from the regular fee. It is often said that doctors have become clerks and bookkeepers.

Where there is no free choice of a physician doctors are dissatisfied. Where there is free choice patients are apt to select the physician who is most ready to grant certificates.

Apparently there are many reasons for the dissatisfaction of the medical profession but it is difficult to see how any of them could be done away with entirely.

GERMANY

When compulsory sickness insurance was taken up by Germany there was but little voluntary insurance. The system was adopted without any precedent upon which to base it. The medical profession was not consulted and probably paid but little attention to the new order. Germany was at that time prosperous and doctors were independent. The scheme covered at first less than 10 per cent of the population, these being the poorer people who in any case could pay but little for medical care.

The government authorized the formation of funds. These were managed by the insured and employers, who contributed to their support. A fund might be established by a trade union, a fraternal organization, a factory or a department store. In addition there were territorial funds, each for a certain locality. All who did not belong to any other fund were automatically included in these local societies.

The state supervises and safeguards the funds. It specifies the maximum payment which can be charged and the minimum benefit to the insured.

Beyond this it interferes but little except in case of disputes between the interested parties.

Since the inauguration of the system numerous extensions of scope have been made. At present all industrial employees, regardless of pay, and others employed at a salary of less than 3,600 marks are covered by the plan. The law does not compel inclusion of the families of the members, but most of the funds now cover these also. In addition, voluntary insurance has become common and it has been estimated that at present between 80 and 90 per cent of the population is insured.

The societies are permitted to collect not more than 7.5 per cent of the wages of each worker. Of this two-thirds is paid by the insured and one-third by the employer. Funds are allowed to grant extra benefits if their finances permit. It will be seen that the contribution of the insured person depends on his pay, contrary to the plan in England. To simplify bookkeeping all liable to the contribution are divided into sixteen wage groups, according to their average pay.

The benefits are a cash payment of half the worker's wage. This begins on the third day of illness and continues for twenty-six weeks, and medical care for the same time. This care is quite complete, including hospitalization if necessary, dentistry, specialists, drugs, laboratory, X-ray and physical therapy. Ordinary appliances, as spectacles, trusses, braces, etc., are provided. Maternity and funeral allowances are included.

Recently, on account of the rapidly growing number applying for treatment for trivial complaints, the patient is compelled to obtain a permit at a cost of 50 pfennigs before seeing the doctor and to pay part of the cost of medicine.

Free choice of doctors from among those appointed by the funds is usually allowed. These are required to appoint one doctor for every 1,000 insured, or one to every 1,350 when families are included. The societies are trying to reduce the number of doctors while the medical men wish all to have right of treating insurance patients. A patient may change his doctor every three months, except when an illness which he is treating lasts over the quarter, in which case he must be retained for the duration of that illness. House visits are made only when the patient is unable to come to the office, and office visits must be made at a certain time. A patient may have consultation whenever he wishes.

At first the funds dealt with the doctors as individuals, but later the medical profession, through several organizations, has been able to bargain collectively with the insurance societies. All of the plans of payment for medical services mentioned previously have been tried and in different localities several are in force now. Perhaps the most general is the following: Instead of paying the doctor directly the funds pay to the doctors' union a fixed amount per quarter for each patient consulting a physician for any purpose during that period. Out of this sum the union pays the doctor, according to the work done by him. He is allowed one mark for an office consultation and two for a house visit. A surgeon is allowed 20 marks for an appendectomy, 40 for a stomach resection.

The union examines each doctor's records and if he seems to be charging unnecessary visits he is warned, fined or dismissed.

As insurance is so general, about 80 per cent of the doctors depend on the system for their living; about 15 per cent work for a salary; and only 5 per cent are able to get sufficient private practice to live.

The class of work done is probably not high, although perhaps the majority of the people receive better services than they would without insurance. In order to make a fair living a doctor must see from 50 to 200 patients a day. Some become very popular by granting disability certificates easily. It is said that few examinations are made. The fee is the same, so the less done the more remunerative the work is. The paper work necessary in handling patients adds very much to the work of the doctor and is a constant cause of complaint.

During the fifty years the system has been in force there has been a constant struggle between the doctors and the funds. This has been for the most part on the ground of fees, which have always been considered too low. However, there have been other controversial points, as the free choice of doctors, interference with treatment, limitation of the number of doctors appointed, etc. The plan has never been even approximately satisfactory to the medical profession. In 1923 the doctors refused to accept the schedule of fees offered and the funds established dispensaries with full time physicians in many places. The profession succeeded in having most of these discontinued.

A young physician has a hard time, as private practice is nearly out of the question and it may be necessary to wait for from three to five years before securing an insurance appointment. It is said that there are several thousand waiting at present.

The administration of the scheme is very complicated and expensive. There are nearly as many lay employees as doctors. The funds are powerful financially and politically. There are 70,000 secretaries of funds and Dr. Liek, in his book on social insurance, says that they are the masters of Germany's destiny.

The funds have in many places built fine office buildings, sanatoria, etc. The doctors complain that much of the money so used should be applied to the payment of better fees.

As in most countries, so here, the number of cases applying for benefits and the average duration of the case have been steadily increasing, this being probably due to the hard times. Efforts are being made to control this. The permit charge of 50 pfennigs was made for this purpose and has had some effect, but is objectionable as it often causes delay in calling a doctor when necessary. Late cases of appendicitis are common, perhaps as a consequence.

Control physicians are used to check up on claimants. In Braunschweig 2,008 patients were ordered to report for check-up. Of these, 816 reported for work at once and 289 were found fit for work by the control doctors.

It may be said that the scheme as applied is unsatisfactory to the medical profession and is perhaps not much better for the patients. The increase in irregular practitioners, who in some localities are said to make up 25 per cent of those treating the sick, has been attributed to the dissatisfaction of the workers with the services under insurance.

A reorganization of the whole system is at present under consideration. This contemplates centralizing the administration, raising the wage limit, extension to include classes of workers not insured at present and to have all claimants under the observation of control physicians. In spite of the unsatisfactory condition it is doubtful if many in or out of the medical profession would consider abolishing it.

ENGLAND

In England, before the passage of the National Insurance Act in 1911, voluntary sickness insurance was common among the working classes. In 1904, 5,700,000 were covered by the friendly societies.

These societies have certain advantages over those under a compulsory scheme, in that the members feel some interest in one another and some loyalty to the organization. It was usually a point of honor not to apply for help more than was necessary. Morbidity statistics taken from voluntary society experience have always resulted in a deficit when applied in compulsory insurance. Membership of these clubs was usually from the more thrifty workers, those most apt to become public charges ordinarily not joining.

Doctors contracted for the care of members on a per capita basis, usually 3 to 4 s. annually. A doctor might start a club of his own on the same basis. The pay was inadequate, the services not of a high order and there was much dissatisfaction among the members of the profession.

The National Insurance Act of 1911 covered sickness and unemployment. The Act is said to have been "hastily prepared, imperfectly considered and inadequately discussed." The methods of politics rather than those of science were employed. There were powerful corporations whose compliance was necessary for the passage of the act and these had to be placated by being given control of its administration. The doctors saw the danger but were susceptible to financial promises and too often the rate of payment stood before efficiency of service. Lloyd George originally intended the treatment of the insured by salaried physicians.

It would be interesting to describe in detail the fight put up by the British Medical Association in the interest of the profession when the act was under consideration. Lloyd George did not consult with the medical profession until he and the insurance companies had laid down the main lines of the scheme. For some years before this time the British Medical Association had been engaged in a campaign to secure better conditions under the voluntary plan, but not much progress had been made when the Act was passed. The association had no precedents to guide them and no experience in fighting the government. In spite of this they waged a fierce and, to an extent, successful battle, which by the way cost them a large sum of money.

The demands of the medical profession were summed up in what were known as the Cardinal Points, as follows:

1. The income limit for compulsory insurance was to be £2 per week.
2. There must be free choice of doctors.
3. The medical benefits were to be administered by local insurance committees, not by the funds.
4. The method of remuneration of physicians adopted by the committee must be that preferred by the majority of doctors in the district.
5. The remuneration must be considered adequate.
6. There must be adequate medical representation on the various bodies administering the insurance.

As to their success in the fight, it may be said that they did well but might have done better. Returning to the Points.

As to Point 1, the income limit, they failed. The objection on the part of the government was the difficulty in administering the plan. Among wage earners pay and employment vary and many would be in and out repeatedly.

Points 2, 3 and 4 were gained.

Point 5. The remuneration has always been considered inadequate by the doctors. This would probably be so in any case.

Point 6. The profession has never considered their representation altogether adequate.

The Act, passed in 1911, went into force in 1913. Up to the last the profession refused offers made them. Then a "rot" set in—some doctors were suspicious of others, fearing the work might go to others; there was a good deal of purely political feeling and fear of opposing the government. At the last minute the authorities announced that 10,000 physicians had offered their services and the fight was over.

In addition to their partial success on their Points, some substantial advantages were gained. The fight of the association and the sympathy aroused in and outside of parliament have made it impossible for the government in the future to act in any similar matter without consultation with the British Medical Association. It never since has denied the right of the doctors to consideration. The Insurance Acts Committee of the Association now meets with representatives of the Ministry on the framing or alteration of any regulations. While they do not always succeed in obtaining what they desire, a fairly satisfactory compromise is usually reached.

The Act applies to all persons between 16 and 65 years of age who are employed in manual labor and to all other employed persons whose remuneration is not over £250 a year. After 65 the old age pension is effective. Many are not included because not employed for wages.

These provisions bring under the plan about 15,000,000 persons or about 35 per cent of the total population, 78 per cent of the occupied, 86 per cent of the employed population.

The state contributes two-ninths of the cost of insurance; the balance is divided equally between the insured and employers. This amounts to 4½ d. a week for each.

The administration of the plan is in the hands of the Ministry of Health, the approved Societies and the Insurance Committees. The approved societies are those which previous to the Act had been writing voluntary insurance and many new ones since organized. The insured are supposed to have a voice in the management but often this is quite vague, as that of a small stockholder in a large corporation. The Societies, as usual, have great financial and political power.

The Act created about 200 Insurance Committees in England, Scotland and Wales. These are made up of representatives of the local council, insured persons, Ministry of Health and panel doctors. There is a committee for each county or county borough in the country. The committees were demanded by the medical profession to escape control by the societies. This committee keeps lists of doctors and druggists who have agreed to undertake insurance work, and also lists of insured arranged as to membership in a society and as to the doctor selected by them. It furnishes each doctor with a list of patients who have selected him. It also oversees the prescribing and the accounts of pharmacists.

Under the Insurance Committee are sub-committees to consider complaints of patients or doctors and matters of a professional character, such as over-prescribing. There is an allocation committee to see that all insured have a doctor, in case they have made no choice or a doctor dies.

The amount collected from the insured in the whole country is pooled and distributed by the

Ministry of Health to the Committee of each district according to the number of insured in each district. The amount assigned divided by the number of insured sets the capitation fee received by the doctors. This varies somewhat but recently has been 9 s. per annum.

In England all insured pay the same amount and are entitled to the same benefit, except a slight difference between men and women. A society may grant additional benefits and this is often done.

The legal benefits are: A cash payment of 15 s. a week for men and 12 s. for women while disabled by sickness, beginning on the fourth day and continuing for twenty-six weeks, after which a disablement allowance of 7 s. 6 d. a week is allowed until recovery or until entitled to old age pension. A maternity benefit of £2 for an insured woman or the wife of an insured man is allowed.

Medical treatment to the insured only.—This treatment is such as a general practitioner is able to give. The services of specialists are not included. In case of doubt as to whether a certain treatment is such as can be expected, the case may be referred to the medical committee. Numerous decisions and rulings already exist. For example, curetting the uterus and setting a fracture of the leg are obligatory; intravenous injections and general anesthetic for tonsillectomy are not.

Obstetrical care and treatment for ten days after labor is not included.

There are no provisions for consultations, laboratory or X-ray work, for nursing, hospital treatment, etc. Drugs are provided.

Every registered physician has a right to have his name placed on the list of insurance doctors. His success depends on his ability to secure patients.

Over two-thirds of the doctors and five-sixths of general practitioners in England are engaged in insurance practice. The average number of patients per doctor is 1,000. No doctor may have more than 2,500 on his list. Under the present capitation fee each doctor receives 9 s. per annum for each insured person on his list, whether sick or well. In addition to the regular fee mileage is allowed for any distance over two miles. The average panel of 1,000 gives a gross income of £450 or $2,250.00. It is estimated that as a rule the doctor receives about as much for treating members of the insured's family. A doctor may sell his list to any registered physician, usually receiving from 9 to 13 s. per capita. A list of 1,000 persons means on the average, for 300 days a year, ten office visits and four house calls.

The insured person has free choice of doctor among those listed. At first he could not change doctors without considerable delay. This rule was given up on the demand of the medical profession but has recently been put into effect again in an attempt to curb the increasing claims of disability. At present a change can be made only at the end of a quarter and with a month's notice.

The income of the profession has been considerably increased by the system. It is said that doctors not in insurance work have been able to increase fees because of the general increase in income.

The work of the doctor has been much increased. Records must be kept, reports made and certificates issued. The doctors complain of this, and it possibly might be simplified, but much of this work is necessary under any such scheme.

In regard to certification of disability the position of the doctor is a difficult one. In England, as everywhere, claims have been increasing rapidly. This increase was in the six years to 1927 from 60 to 100 per cent. This seems to be due largely to a change in the attitude, a lowered morale among the insured. It seems that they are out for all they can get. When impediments to a change of doctor were removed a powerful weapon was put into the hands of the insured. A doctor who refused to issue certificates, when asked, lost his patients. It is said that 99 per cent of changes of doctor were because of refusal to certify disability rather than dissatisfaction with treatment.

The Ministry of Health appoints Regional Medical Officers who examine cases referred by an approved society or panel physician. In 1927 of 210,000 referred for examination nearly one-half failed to appear and only 50,000 were found incapable of work.

The amount allowed for medicines is limited. If any doctor's prescriptions exceed the average they are investigated by a committee and if found more expensive than necessary the excess may be deducted from his pay. There is a tendency to over-prescribe, as the patients demand medicine. The amount paid for drugs is about one-third of that paid doctors.

On account of the increased claims the Ministry has warned the societies that they might have to reduce benefits. They are urged to investigate in order to determine whether certificates should be accepted. Doctors have been warned to exercise more care in granting certificates.

Recently it has been proposed to reduce the capitation fee by 10 per cent. So far the doctors have refused to accept this.

On the whole the system has been fairly satisfactory. In 1922 the British Medical Association passed a resolution stating that it was sufficiently successful to warrant continuance. There is still considerable opposition on the part of members of the profession but the majority favor it. According to the Association large numbers received medical service who formerly were without it, the treatment is better than under the old clubs and is applied for earlier. There is some interest taken in prevention, clinical records are being accumulated which may be of value and there is more coöperation and feeling of responsibility among physicians. There is still much superficial work done.

There is need for more extensive service, especially the inclusion of hospital care, specialists, laboratory work and nursing. At present from 50 to 60 per cent of patients applying for treatment in free dispensaries are insured persons, showing that they are not entirely satisfied with the service. This may be partly due to the lack of specialists.

Among the changes in the system which have been recently proposed is the inclusion of the families of the insured in the plan. Probably this would decrease the income of the doctor as the pay would be apt to be less than he receives treating them as private patients. Reduction of the number of patients on a doctor's list also has been considered. To this the doctors would agree providing the capitation fee were raised. A raise in the income limit has also been suggested, and the companies would like to employ salaried physicians. This is strenuously objected to by the profession.

NORWAY

Here the application of the system differs in several particulars from that in Germany and England. Here insurance was established in 1911. It covers the family of the insured. Manual workers are all insured. Non-manual wage earners were included if their annual salary was below 6,000 kronen, but this limit has recently been lowered to 5,200 kronen. This lowering of the salary limit is unusual, the tendency being to raise it.

The number of insurance organizations is limited and only one may do business in a locality.

The insured is allowed a certain amount for medical services, for instance in Oslo, 3.50 kronen for an office consultation and 5 kronen for a house visit. The doctor, however, charges what he sees fit for his service and the patient must pay the difference. In some localities the doctors have agreed with the insurance institution not to exceed a certain charge. This method of payment is liked by the medical profession, is fairly satisfactory to the societies, but the patients usually object to paying more than is covered by the insurance. The doctors here as elsewhere complain about the amount of clerical work, certificates, etc., for which they receive no pay.

An unusual provision is that the patient has to pay for medicines and appliances.

Contrasted with the English system, here the tendency is for the patient to receive too much attention; in England too little. In England the doctor may give a patient all the attention a patient needs without being suspected of mercenary motives but also is apt to neglect him. When the patient has to pay for drugs he is more apt to be satisfied with advice instead of the customary bottle of medicine.

In Norway the system is perhaps more satisfactory to the profession than in other countries. It is to be remembered that here there is one doctor to about every 1,800 people.

FRANCE

In France compulsory insurance is just being put into effect. The law is said to be a bad one and some think that it will be impossible to apply it. It is apparently a disappointment even to the beneficiaries, on account of the complications, formalities and small benefits. The medical profession has refused to accept the tariff proposed, and charge regular fees which are much greater than the amount allowed by the insurance companies. The Minister of Health has threatened to appoint full time salaried doctors to do the work.

DENMARK

It may be of interest to consider briefly the situation in Denmark. Here insurance is not compulsory in a legal sense, but the percentage of insured is about the same as in countries where the compulsory system is in force. In 1928 about 65 per cent of the population over 15 years of age was covered.

The insurance companies are under a certain amount of government control as to assets, minimum benefits, etc. The state subsidizes the companies to a certain extent, giving them much reduced rates in hospitals and other advantages.

In this country when a person receives aid from the public authorities he becomes a citizen of the second class. He is not allowed to vote, cannot be married without consent of the authorities, is not eligible for old age pension and must repay the government if it ever becomes possible.

These penalties apparently exert an indirect compulsion to insurance.

The Danish Medical Association represents the entire profession, makes contracts with the insurance companies and specifies the rate of compensation of the doctors.

Medical care rests with the doctor without control. Physicians are paid on a capitation basis in some localities and in others for services rendered.

The medical profession seems well satisfied under this system.

CO-OPERATION*

C. E. Rudolph, D.D.S.
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It IS indeed a compliment to be asked to appear before this group, and especially do I think the subject assigned very appropriate at this time. I do not say this because of the knowledge of undue friction between the two professions which we represent, but because of the social and political problems which confront us. I am certain that the practitioners of medicine in this Northern Minnesota Medical Association are fully aware of the present status of Medicine and Dentistry in their relationship to the body politic, but I am not so sure that all of us know the trends of lay thinking regarding our social position and economic responsibility to that body. If you have been following closely the better magazines and many of the daily papers of the day, you must realize that the thinking laity are studying the problem of medical care, and are devising ways and means in many localities for the dispensing of medical care. In many instances this is done under the direction of laymen. In other words, they are questioning our ability and inclination to solve the social problem which they feel now confronts this nation, and which involves us especially. I believe I said the thinking lay people were behind this movement. As evidence of this, I may cite the work of the committee on the Costs of Medical Care headed by the Secretary of the Interior, Dr. Ray Lyman Wilbur. No doubt you are quite familiar with its work to date; if not, each one of you who is in the practice of medicine should make it his business to become so. Much comment on the committee's work has already been in the press and the final conclusions are to be given to the press for public consumption.

If you will stop for a moment and ponder over this you will have perhaps one of two reactions: either you will feel perfectly safe with your phase of the problem as studied and conclusions arrived at by your members of this committee, or you will become indignant and question anybody's right to attempt to regulate your professional and business methods in dispensing that which you have educated yourselves to dispense.

Before any of us get excited let us see how much the government (village to the federal) regulates our daily work as we find it today. First, we probably pay much less than half of the cost of our education. The village, county, city, and state furnishes the rest. Next, the state examines and licenses us to practice. When we begin practice we find many barriers and restrictions set up to guide our daily work, which all of us know without mentioning. Next, we find that certain groups have attempted to furnish medical care through their officers or appointed officials, who, in turn, dictate or arbitrate the matter of costs, especially, with our professions. Along with this, we find some insurance companies, aided and abetted by the more or less socialistic elements, delving into the mysteries of medicine and attempting to dictate the medical welfare of the people who make up the middle economic class. We can't forget that each one of us must carry compensation insurance or not employ anyone. Many of us have had our patients' diagnosis made and the fee set for our services by a layman, usually an insurance adjuster, before we even see the patient, so that all we have to do is go to work. I am not saying these things in a spirit of criticism at all, but merely stating facts and the tendencies of the natural processes of evolution in medical economics. You and I, to date, are the progeny or product, if you like, of precariously guided medical forces. All or most of the tendencies have been toward scientific progress, much to our credit, with not too much thought given to the social problems involved, a little to our discredit.

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We must recognize that the world is growing up. We have much older relatives, economically and socially speaking, on the other continents than we, and what has happened to them in their evolutionary processes is apt to happen to us. Our Committee on the Costs of Medical Care knows considerable about the processes which have finally socialized medicine in the other countries and our field men are still over there. Practically all of the civilized nations of the world have some form of socialized medical care. How we can sit idly by and smugly reiterate to ourselves that it can't happen here because of our different world economic level, is a mystery yet to be solved.

It has, until lately, been almost an insult to the intelligence of the mass of physicians and dentists of this country to even suggest that anyone was dissatisfied in the least with the medical care so generously dispensed. The statistical material gleaned by your committee should put a different meaning on the whole problem, and it is altogether too bad that each one of us has not the privilege of receiving all this material, digesting it, and then coming to conclusions which might otherwise seem so easily arrived at. At this point I am going to inject a few facts found by this committee on costs, and while I am doing all this talking I would not have you think that I have forgotten what my subject is.

With your indulgence I will spend a few minutes with factual material which may be used as a background for further discussion.

Population Data.—"Americans inhabit a territory of more than 3 million square miles, with an average density of 41 persons per square mile, ranging from 20,000 per square mile in Manhattan to less than 1 per square mile in Nevada. Twelve per cent lives in Metropolitan centers of a million or more, and 44 per cent in rural areas or communities of less than 2,500 persons. Nearly 90 per cent of the population is white and 10 per cent is colored; only 55 per cent is native white of native parentage."

Quite naturally we have not taken into consideration the elements of socialistic tendencies in the white group which represents the remaining 45 per cent. Most of these people have been through the socialistic medical evolution in some country of Europe. Many of them can think only of the benefits which they receive personally without having the least idea of what the effect has been upon the professions. Perhaps some of you don't know that medicine was socialized in Germany as long ago as 1883 by an imperial edict. This was the beginning and other central European countries followed. England's House of Commons passed socialized medical legislation in 1911; France in 1928. The history of these three countries regarding the methods used in passing this legislation is peculiarly interesting.

"Thirty-two per cent of the population in 1920 was under 15 years of age, 9 per cent was 15 to 19, 38 per cent was 20 to 44, and 21 per cent over 44. The age distribution is changing steadily because of decreasing birth rates and decreasing death rates. It has been estimated that, by 1975, 26 per cent of the population will be 50 years of age or over as compared with 16 per cent in 1920 and 9 per cent in 1890. In 1920 there were 104 males per 100 females. Six per cent of the people in the U. S. were illiterate in 1920; the percentages for negroes and foreign-born whites were 23 and 13 respectively. People in the United States must adjust themselves to a wide variety of climates, for temperatures have ranged from a maximum of 119 at Phoenix, Arizona, to a minimum of 45 below zero at Bismarck, N. D."

Economic Data.—"There were, in 1920, 33,000,000 males and 8,500,000 females (about 40 per cent of the total population) 10 years of age and over who were engaged in gainful operations. Thirty-one per cent of employed persons are engaged in manufacturing and mechanical industries and 26 per cent in agriculture, forestry, and animal husbandry." Thus 40 per cent of the people support the remaining 60 per cent, who include, of course, children, the aged and retired.

"The per capita income of the consumers of medical service (all the people) has been estimated for 1929, by the National Industrial Conference Board, at $692. This is merely an average, and does not at all represent the distribution of purchasing power. Of the 42 million occupied persons, about 86 per cent in 1918 earned less than $2,000 a year. At the other end of the scale, 2 per cent of earned incomes were more than $5,000 a year. Family incomes are somewhat larger than individual incomes. In 1926, about 48 per cent of all New York families had incomes of less than $2,500.

"The minimum cost of maintaining a 'fair American standard of living' for the family of an industrial worker has been estimated to range from $1,442 to $1,660, varying somewhat with the size of the city in which the worker resides. Since, according to 1918 figures, 39 per cent of the employed people had incomes of less than $1,500, they could not support a family at a 'fair American standard' with only one wage-earner. In some instances, of course, one family had two or more incomes."

"Extent of Illness and of Physical and Mental Defects.—A great variety of diseases and mental defects disable many members of the national community or prevent them from living in complete health. There are, on the average, two illnesses per person per year for which medical care is desirable or necessary and three defects per person, a considerable proportion of which probably requires medical treatment. About two per cent of the population of the United States are disabled by illness on any 'average' day of the year."

Two per cent of 123,000,000 would be 2,460,000 persons. The potential earning power of these persons might be estimated, say, at $2.00 per day, a wage far below the "fair American standard of living," and we have a daily loss of $5,852,000 in wages. This does not even come close to the actual loss, as you will recognize, but it gives a definite picture. The question arises, how much of this is preventable, and here is the crux of the whole situation.

Business men are interested in their losses sustained by the poor health of their employees. They are questioning the present methods of meeting their demands and in some cases they are taking the matter into their own hands and hiring medical services at so much per and getting results from a monetary point of view. You may have your own ideas of the standard of medical services dispensed by these hired servants, but the fact remains with the employer that in the aggregate he has saved money, and that talks with him. Just take this trend of medical care dispensation and glimpse, if you will, into the political and sociological possibilities, which are easily perceived by the smart politician and social worker, trained or untrained, and you see the reason for all the barriers we mentioned at the beginning. Project yourself just one step further and come to your own conclusions regarding state medicine or whatever name you wish to call it, for we are not standing still.

"Costs of Medical Care.—Various studies place the average cost of medical care at $70 to $230 per family per year, and estimates of the total for the United States as a whole range from $2,000,000,000 to $3,000,000,000 per year. The 'average' figures, however, are relatively meaningless in this field because of the extreme range among families, even among families in the same income group."

THE SUPPLY OF MEDICAL SERVICES

"I. The Supply of Medical Facilities.—Nearly 1,500,000 persons are now engaged in supplying various types of medical services to the people of the United States. Of these, 143,000 are physicians, and 67,000 are dentists. There are over 850,000 hospital beds in the country, of which 370,000 are in nervous and mental hospitals. There are at least 5,700 out-patient departments and other clinics in the United States, only a few of which are private group clinics.

"Although this existing supply of medical personnel, hospitals and clinics may be adequate or nearly adequate for the present existing demand, quite another question is raised if it is compared with the supply necessary to meet all the people's real needs.

"*II. Basic Costs of Medical Care.*—Medical service is not a 'free good.' Its costs of production are high, and must be met, either by the community or the individual consumer. The main items in the cost of production are the costs of training personnel, the capital investment in hospitals and in private practice, and the current expenses of hospitals and practitioners.

"1. *Costs of Training Physicians.*

"a. *Preliminary requirements.* A large percentage of medical students now take four years in liberal arts work before entering upon their medical courses.

"b. *Medical course.* Most medical courses now require four years of work, so difficult the student has little time for earning his expenses. (Less than $300 a year was the average for 518 students who reported earnings to the American Medical Association; less than half of the total number of students and any earnings.)

"c. *Internship and postgraduate work.* Practically all physicians now take an internship. In addition, the practice of taking special courses is growing among physicians who expect to specialize.

"d. *Total cost.* The cost of medical education to the student or his family is estimated to be about $4,500; an additional large item in the 'cost of production' of a physician is borne by the medical schools and hospitals and thus, indirectly, by the public.

"2. *Costs of Training Dentists.*—The dental curriculum increased in the majority of schools from two years in 1890 to four years by 1917. The total income of forty-two dentist colleges for the year 1924-5 was nearly $6,000,000, of which nearly $3,000,000 was paid by students, and $1,600,000 by patients.

"3. *Capital Investment in Hospitals.*—It is estimated that the capital investment of American hospitals now totals at least $3,125,000,000 and that at least $200,000,000 per year is spent in replacements, additions, and new projects. This ranks the 'hospital business' as one of the leading businesses in the United States.

"4. *Capital Investments of Individual Practitioners.*—In addition to the time and expense of education and training, the individual practitioners of medicine and dentistry frequently invest considerable sums in equipment. The mean average investments made during a ten year period by sample groups of practitioners covered in community surveys range from $1,860 to $3,310 for physicians and from $1,698 to $5,927 for dentists. The crude unweighted averages are $2,700 for physicians and $3,100 for dentists. These averages include only expenditures during a ten year period, while some equipment, of course, lasts longer than ten years. The total investment, therefore, for a physician's or dentist's entire professional life is undoubtedly greater than these amounts.

"*III. Current Expenses of Hospitals and Practitioners.*—Current hospital expenditures have been estimated at $4,000,000,000to $550,000,000 annually. They are large and tend to grow larger with the increase of hospitals and the growing complexity of care furnished therein.

"Private practitioners have current expenses for office rent, supplies, clinical and nursing assistance, laboratory costs, etc. The crude average ratio of expenses to total gross incomes as found in the community surveys is forty per cent for both physicians and dentists.

"*IV. Incomes of Practitioners.*—The 'average' net incomes of physicians and dentists in five community surveys are:

	Physicians	Dentists
Shelby	$3,419	$2,744
Philadelphia	5,156	5,102
Detroit	5,596	6,067
Vermont	4,998	4,187
San Joaquin	7,187	4,875
Crude unweighted average	$5,271	$4,595

"These averages, however, like the average incomes of other people, are far from representative of the bulk of the practitioners. A distribution of the incomes of physicians and dentists in Philadelphia indicates that one-half of the physicians earn less than $4,207 and one-half of the dentists less than $4,000. The same general type of distribution was found in Detroit. Private duty nurses in Philadelphia report annual incomes averaging about $1,300 (a more representative figure in this case)."

During the last few months much other data has been collected: Dental Income Study, Medical Student Costs, Costs of Equipping Dental Office, etc. In each of these studies and all those that have been made up to last May certain definite tendencies are noticeable. For instance, just one, the tendency to specialize in some branch, leaves the number of general practitioners below actual needs in certain districts, and above in others. We note from our field studies that the so-called specialist these days has a larger income than a general practitioner, and quite naturally the rank and file want to become affluent. Have you stopped to think what the 86 per cent of the people of this country are going to use for money when they are directed to employ a specialist in the present order of things?

Here is a bit of interesting data found to be true in Shelby County, Ind. The people of this county spend more for patent medicine in a year than they do for the services of physicians. This opens the field for "lay medical education," if I may use the caption. How far should we go with this phase of the problem? How much does the public deserve and where should it come from? It is just a possibility that we have been so interested in the purely scientific phase of our professions that we have forgotten to dispense the proper educational propaganda to insure our professional lives. I know how hide-bound you and I are in our ethics and we are both afraid to step out with a new program, but if we do not, some one who knows a whole lot less about our ethical and altruistic tendencies than we do ourselves will, and by popular consent, not ours. We will have to acquiesce, as the professions have had to do in the older countries.

Not many of us are hankering to go to Austria or England to practice. On the other hand, not many of us are trying to devise ways and means whereby our existence as private practitioners will be insured in this country. This brings me to the subject of the evening, and here I cannot refrain from giving a little historical data regarding the entry of the three countries, I have already mentioned, into socialized medicine.

I mentioned that Germany was socialized by imperial edict. This happened almost over night and it was done to satisfy pressure brought to bear by the working classes. The professional men were not taken into consideration, and medicine has not improved perceptibly, especially since the war, and now less than 5 per cent of the physicians in Germany have private practices.

In England the people of the lower economic classes put on the pressure and, while the process of getting the law through took considerable time, the professional men simply tried as individuals to stem the tide by saying "it can't be done" and "it must not be done," and finally in 1911 it was done and the physicians and dentists have been fighting for twenty years to make it possible for a patient to choose his own physician. This was finally accomplished one year ago last July.

France has a little different story. A number of years ago, the professions realized that it was just a matter of time before the issue of socialized medicine would come directly before their lawmaking body. The socialistic tendencies were definite and easily recognized. Men of sound judgment were sent to the surrounding countries and all available material gathered and studied by the professions. The professions, as a result, united into a working body and became distinctly politically minded. By the time the laws were drafted and finally passed, every governmental committee of any kind which dealt with health measures in any degree had at least one strong member from the medical and dental professions as a member of it, and the result is that the most healthy condition, from a medical economic point of view, obtains in France. The insurance companies happen to be in the unfavorable position. The outcome in France to date is the result of concerted effort on the part of both professions. It has taken a solid front to accomplish what they have done. I have not the time to go into details regarding the exact status in any of these countries, but sufficient to say, that from a medical economic point of view, which, by the way, is at all times altruistic, France leads Europe.

The spirit of coöperation must pervade the medical groups in this country to insure the proper guidance of the tendencies of socialized medical legislation. It is foolish to think we have no such tendencies. All but four states have compensation laws. All the foundations have been laid. Our unhealthy complexes, if we have them, must be put aside in oncoming years if we can hope to cope with the problems which will be forced upon us as sure as fate. Perhaps you are beginning to feel sorry for me in my apparent sentimental state of mind. I am well aware that sentiment alone does not suffice in arguing a case before logical judgment. On the other hand, mere statement of fact will scarcely ever win a debate with the popular mind as the judge. Combine logic with the proper amount of sentiment and you have an appealing and convincing prescription. For sentimental reasons, I might call a plumber to plaster my house, but as a matter of fact I would have a terrible mess of things if he attempted the job. By the same token, why should an insurance adjuster, politician, or any other unqualified person dictate the medical welfare of this nation? Remember we are not going to be called into politics or social service by the laity. It is our business, and we should be about it. We are part of the so-called learned professions which comprise the upper fifth of the intellectuals of this country, and are expected to lead the way in our particular phase of life. Any misstep on our part might mean the hampering of our scientific, social and economic status for a generation or more to come.

In conclusion, I should like to make this very earnest appeal. Let every man in each profession representing medical care become interested to full capacity in the political and economic, as well as professional side of his profession. Let each man be tolerant of his brother practitioner and be willing to work in harmony for the upbuilding of the professions at all times, and especially stand as a man against any belittling or disorganizing propaganda which might be brought to bear from outside sources. Finally, it is my conviction that the three principles proposed by Dr. Ray Lyman Wilbur will not only safeguard the public, but the professions as well, and they are:

"1. The personal relation between patient and physician must be preserved in any effective system of medical service.

"2. The concept of medical service of the community should include a systematic and intensive use of preventive measures in private practice and effective support of preventive measures in public health work.

"3. The medical service of a community should include the necessary facilities for adequate diagnosis and treatment."

SURGICAL CONSIDERATIONS OF ANGINA PECTORIS*

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The syndrome described as angina pectoris represents a complicated pathologic cardiac mechanism; hence it is unreasonable to expect any one form of medical or surgical treatment to relieve all anginoid pains. The paroxysmal attacks are believed to be initiated by anemia or anoxemia of the cardiac muscle under increased exertion. The constant pain in the precordium which radiates down one arm or both arms is due probably to neuritic changes accompanying the organic disease of the aorta, coronary vessels and myocardium.

Various opinions are held concerning the pathologic etiology. Some observers hold that sclerotic changes in the aorta are responsible for the paroxysmal attacks, and many others believe that the sclerotic changes in the coronary vessels with the associated myocardial degeneration are responsible for the attacks. However, since many attacks are initiated by emotion, aggravated by exertion and are temporarily relieved by vasodilating drugs, it is fair to assume that vasomotor spasm of the coronary arteries or their terminal branches contribute to the syndrome, and that surgical intervention may be called on to assist in relieving the vasomotor or painful stimuli.

The mechanism of the heart is controlled by efferent and afferent nerves from the vagus and sympathetic nerves, in addition to its intrinsic nerves. The depressor nerve has its origin in the superior sympathetic ganglion and in the upper ganglion of the vagus nerve. Following the fusion of the nerves from these two sources it travels free in the neck to end in the suprasigmoid portion of the aorta, and according to Koster and Taschermak, it is known to be a purely sensory nerve to the aorta. Other vagal fibers communicate with the superior, middle and inferior cardiac nerves and according to Green are capable of influencing acceleration as well as carrying depressor stimuli. The sympathetic accelerator nerves, according to Ionescu and Enaschesu, and to Cannon and his co-workers, take origin from the upper five thoracic ganglia and enter the cardiac plexuses by the cardiac nerves and by direct communication from the third, fourth and fifth thoracic ganglia. The vasomotor stimuli from the upper thoracic sympathetic ganglia pass through the upper thoracic trunk and the three cervical ganglia to enter the superior cardiac nerve, thence to be disseminated through the cardiac plexus to the coronary arteries. According to Ranson, Edgworth and Kuntz, painful stimuli from the cardiac and coronary mechanism reach the upper part of the thoracic portion of the spinal cord by medullated fibers which pass through the middle and inferior cardiac nerves, middle and lower cervical ganglia, the two upper thoracic ganglia, the white rami communicantes, and the dorsal roots.

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*From the Section on Neurologic Surgery, The Mayo Clinic, Rochester, Minnesota. Abstract of paper read before the Minnesota Society of Internal Medicine, St. Paul, November 1, 1931.

Jonnesco, in 1916, at the suggestion of Francois Franck, resected the cervicothoracic sympathetic trunk including the middle cervical and stellate sympathetic ganglion for angina pectoris. Coffey and Brown advocated resection of the superior sympathetic ganglion on one side or on both sides. Cutter, Penfield and Gilbert, Kerr and many others have reported numerous experiences in the treatment of angina pectoris by sympathetic cervicothoracic ganglionectomy and trunk resection by the anterior Jonnesco approach. White had advocated paravertebral injection of alcohol of the upper five thoracic nerves on the left side for anginoid attacks.

Since the results have varied from complete success to partial success and failures, I have been impressed with the fact that the good results of surgery will depend on the more accurate selection of operation for the individual patient. In order to arrive at such a selection I believe much can be learned in comparing the symptoms, pathologic changes, and results obtained by medical treatment, and by sympathectomy in disease of the peripheral vessels of the extremities with those of the coronary vessels of the heart, as it is my impression that many analogous lesions exist.

Raynaud's disease of peripheral vessels may be compared with angina pectoris of the mild type in young subjects, in whom arteriosclerotic changes cannot be demonstrated. But as Raynaud's disease progresses, trophic lesions soon develop and give rise to degenerative lesions in the skin, subareolar, fibrous, nervous, muscular, ligamentous and osseous tissues which may be compared with the myocardial changes and be responsible for continuous pain and the intermittent claudication on increased exercise. The pathologic changes and symptoms following arterial sclerosis of the arteries of the legs and feet unquestionably simulate the cardiac syndrome in senile patients. The patients complain of continuous pain and intermittent claudication, and neither group receives relief from vasodilating drugs or from operation. The pain is only relieved by interrupting the afferent fibers either by section or by destruction of nerves with drugs.

It is possible that thrombo-angiitis obliterans with its associated vasomotor spasm may be the predominating factor in the production of coronary infarcts in middle-aged men, since I have seen at necropsy lesions of the coronary arteries that were similar to those previously recognized and demonstrated in the vessels in the feet and legs. The occlusive lesions due to arterial sclerosis of peripheral vessels which result in pain and gangrene again appear to be analogous to the coronary disease, only death ensues before the terminal stages of degeneration of muscle take place.

Therefore, in the light of anatomic and pathologic evidence one might assume that angina pectoris occurring in a young person might be due to vasomotor spasm of the coronary arteries, which explains why vasodilating drugs or any operation that divides nerve fibers carrying vasomotor responses gives relief. It is in this group that single or bilateral superior cervical sympathectomy has been so effective.

If, however, one were dealing with two etiologic factors, that is, organic lesions of the coronary arteries with a superimposed vasomotor spasm on normal coronary branches, superior cervical ganglionectomy would fail to give the results accomplished by a Jonnesco operation, since the later operation not only includes the vasomotor fibers but many of the afferent pain fibers returning through the middle and inferior cardiac nerves. When this operation is indicated the posterior approach to the cervicothoracic ganglion is more effective, since there is less chance of missing the first thoracic ganglion by the posterior approach than there is by the anterior superior approach. However, if the cardiac lesion is void of any vasomotor phenomena and is due to coronary or aortic sclerosis, it is readily understood why patients may continue to have light attacks of pain, even though both cervicothoracic ganglia have been removed, since the fibers of the depressor nerve and the second, third and fourth thoracic nerves receive afferent fibers carrying painful stimuli independent of the superior, middle and inferior cardiac nerves, and it is in such cases that vasodilating drugs likewise fail and paravertebral alcoholic injections have to be resorted to for symptomatic relief.

Therefore, surgical treatment of angina pectoris is indicated if patients are young, if they present vasomotor phenomena, and if they would otherwise be compelled to undergo medical treatment for years. Sympathectomy is indicated in conjunction with medical treatment when either treatment alone fails to give complete relief. Paravertebral injection of alcohol of the upper thoracic nerves is a procedure that is indicated in extremely senile patients when medical treatment fails, and when the lesion is due to sclerotic changes rather than to vasomotor spasm.

AIDS IN THE DIAGNOSIS OF HIP-JOINT DISORDERS*

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THE hip-joint provides more difficulties than any other joint, to beginners and experienced alike, when it becomes necessary to determine the nature of some disturbance of function due to disease or injury. The depth of the joint from the body surface makes direct palpation impossible or unreliable and one is forced to rely more and more upon signs and various measurements in arriving at a diagnosis. A proper understanding of some of the common signs and measurements is necessary if one is to reduce his percentage of error in diagnosis to a minimum. Usually a child with a limp reporting for treatment causes some worry and consternation when it walks into the office, and it is only by most painstaking palpation, mensuration, radiographic and laboratory examinations that one is able to arrive at the correct interpretation of the existing condition.

It is not the purpose of this brief paper to discuss at length all the details of various signs but to merely refresh in your minds the ones most frequently used, and therefore most practical and dependable.

The hip is a ball and socket joint, stable, strong, and freely movable by virtue of its deep, solid bony socket made up of parts of the ilium, pubis and ischium, its reinforcing ligaments and powerful muscles. This joint is second only to the shoulder in its mobility and is supplied with checks against an excessive range of motion. As an example one finds the iliofemoral or "Y" ligament of Bigelow preventing hyperextension beyond the normal 45°. In like manner flexion, adduction, abduction and rotation are checked by ligaments, the various muscles attached about the hip joint, or by the approximation of adjacent parts of the body.

The most important aid in the diagnosis of hip disease is a knowledge of the etiology of changes in the gait. It is quite essential for the patient to be stripped for the examination. Before any other examination is made the patient should be asked first to stand and secondly to walk across the floor so that the erect posture and gait may be studied. There is no doubt that careful observation from these two aspects saves a great deal of time as the attention is immediately directed to the abnormal extremity.

Pain in the hip causes a very characteristic limp which can hardly be mistaken once it has been seen. Putting the weight down on the extremity of the affected side causes pain which results in the patient flinching and hopping quickly onto the other leg. The steps taken on the affected side are very short and when standing all the weight is borne on the normal leg.

A limp caused by a flexion deformity necessitates a sudden forward movement of the entire body as the weight is brought down on the affected side, giving to the gait a typical bowing movement. When standing erect the flexion of the hip is compensated for by increasing the lordosis of the lumbar spine. Most of the weight is borne on the normal side or on both feet by standing on the toes with the affected foot held in the equinus position (Fig. 1).

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*From the Department of Orthopedic Surgery, The Miller Clinic, St. Paul.

When the hip is deformed in the abduction position the extremity is held away from the midline of the body as it is apparently lower than its normal companion. When the deformity is one of adduction the hip of the affected side is very prominent, the extremity apparently shortened, and the gait has a characteristic lurch. When observed from in front the relationship of the adducted or abducted extremity to the pelvis remains unchanged during every phase of a step whereas normally this relationship changes with each phase.

If the extremity is shortened the patient walks on the toes of the affected side or due to the dropping of the pelvis on that side with each step he is obliged to lean the entire body toward the affected side as he steps, conpensating for the shortening when standing by the development of a postural or static scoliosis which later becomes a structural one.

The limp of a congenitally dislocated hip is typical in both the unilateral and bilateral cases. Due to the dislocation of the head of the femur from the acetabulum, each time the patient steps on the affected side there is no fixed point of support for the body weight, and as a result the pelvis drops on the unaffected side, producing a lurch in the gait, with the patient rising on the stable side before making his next step. If both hips are dislocated the gait can be likened to that of the waddle of a duck. A marked lordosis with prominent buttocks is also a conspicuous feature, as is external rotation of the feet, and the widening of the perineum.

After a study of the gait and attitude of the patient one may proceed to the true determination of the nature of the deformity by measurement of the ankylosed positions of the joints, range of motion in partially ankylosed joints, stability of the joints on weight bearing and the comparative length of the extremities. This examination concerns chiefly the topographical anatomy of the hip joint.

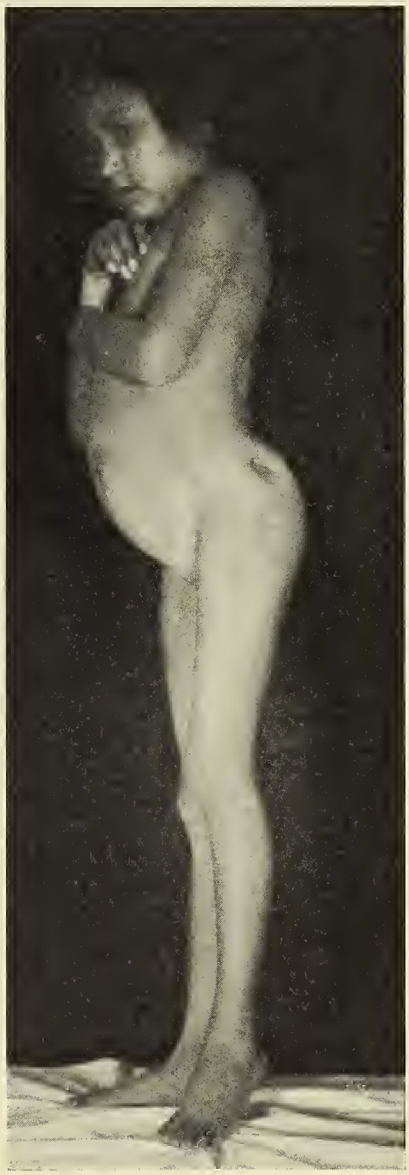

Figure 1. Lateral view of a patient with hip joint ankylosed in a flexed position shows the marked increase in lumbar lordosis necessary to get the limb into the vertical axis of the body. The foot on the side of disease is held in equinus so as to get weight-bearing on both feet by standing on the toes.

In order to get weight-bearing on both feet it is necessary to keep the foot in equinus on the side of the disease, making up for the shortening to some extent.

There are many lines and prominences on the body surface which may be utilized for determining changes in the position of the head of the femur in respect to the acetabulum, due to dislocation, fracture, disease and destruction of either part, or changes in the relative positions of the greater trochanter and head of the femur such as one finds in alterations of the angle of the neck of the femur in the so-called coxa vara and coxa valga.

The prominences used to determine various lines are the anterior and posterior superior iliac spines, the tip of the greater trochanter of the femur, and the tuberosity of the ischium.

It is intended here to enumerate a number of these signs indicating wherever possible the comparative value of each.

Bryant's line or triangle is probably the most universally used because of the possible accuracy of the measurements. With the patient on his back on a table a perpendicular line is dropped from the anterior superior spine forming one side of the triangle. A line is then drawn from the tip of the great trochanter to the anterior superior spine forming the hypotenuse of the triangle. A third line, drawn at right angles from the perpendicular line to the tip of the trochanter, forms the base and it is to this line that Bryant refers chiefly. Normally the length of this base line should be equal on both sides. If the line is shorter than on the normal side it means that the trochanter is in a relatively higher position than normal due to dislocation of the hip, destruction of the head or neck of the femur or roof of the acetabulum by disease or fracture, or to a decrease in the angulation of the neck of the femur with the shaft thus approaching a right angle as in coxa vara. In contrast, if the line is longer than on the normal side we may have dislocation of the hip below the acetabulum, or a change in the angulation of the neck of the femur with the shaft approaching a straight line as in coxa valga. In Bryant's opinion the chief value of this line was to demonstrate impaction of a fracture of the neck of the femur although we have come to use it more generally.

Nelaton's line may be placed next in order as it is probably the second in usefulness and in

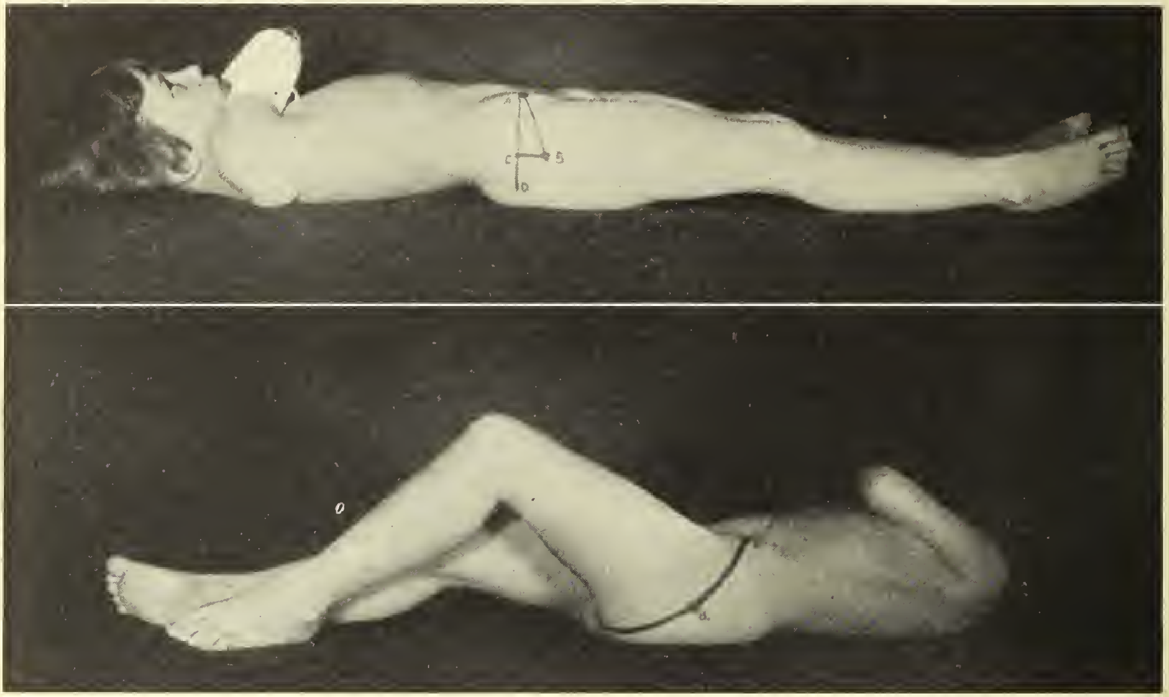

Figure 2. *(above)* Bryant's line or triangle.

With the patient lying on her back on a table a vertical line is dropped from the anterior superior spine (A) to the table. A line (A-B) is then drawn from the anterior superior spine to the tip of the greater trochanter. A line (B-C) is then drawn from the greater trochanter perpendicular to (A-D) forming the base-line of the triangle A-B-C. This triangle is referred to as Bryant's triangle or the base-line as Bryant's line.

(below) Nelaton's line.

With the hip flexed about 50° a line ABC drawn from the anterior superior spine to the ischial tuberosity passes through the tip of the greater trochanter (B).

familiarity. If the anterior superior spine is joined to the tuberosity of the ischium by a straight line the tip of the greater trochanter will be crossed by this line. The trochanter will be found riding above this line in the same conditions which cause a shortening of Bryant's line and riding below this line with lengthening of Bryant's line (Fig. 2).

Among the other less familiar lines are:

1. Petersen's line which is a horizontal one drawn through the upper border of the symphysis pubis. Normally the tips of the greater trochanters are level with this line. Its usefulness is limited, however, as it is difficult in many patients to define the upper border of the symphysis.
2. Shoemaker's line is interesting especially in congenital dislocation of the hip. This is merely the prolongation of the line joining the tip of the greater trochanter to the anterior spine across the median line of the abdomen. Normally this line bisects the median plane at or above the umbilicus, whereas, if the hip is dislocated or involved by any of the factors accompanied by a shortening of Bryant's line the median plane is crossed below the umbilicus (Fig. 3).

The gluteal folds form a horizontal line if the legs are of the same length and form an angle with the horizontal if the length of the two legs is different.

Morris' bitrochanteric test is useful at times although one can obtain almost as reliable information by speculation and Bryant's line. A measuring stick calibrated from the center toward each end is placed so that the center corresponds to the median plane of the abdomen. The distance of each greater trochanter from the mid-line is measured. Destruction of the neck of the femur, the head, or the acetabulum due to fracture or disease may lead to a loss of length in this line as compared to the normal side. For practical purposes this test may be cast aside.

In addition to information regarding the relative position of the head of the femur and greater trochanter to the acetabulum one must frequently make comparative measurements of the two extremities as regards length, flexion, adduction, abduction, and rotation. It is of prime importance in the correction of hip deformities for one to be thoroughly conversant with the methods of measuring the length of the legs as well as the degree of adduction, abduction, or flexion in deformities.

Restriction of flexion probably occurs most frequently in hip deformities although it is rarely found unaccompanied by adduction or abduction limitations. It is very important to differentiate a permanent flexion deformity due to disease of the hip joint from that often found accompany-

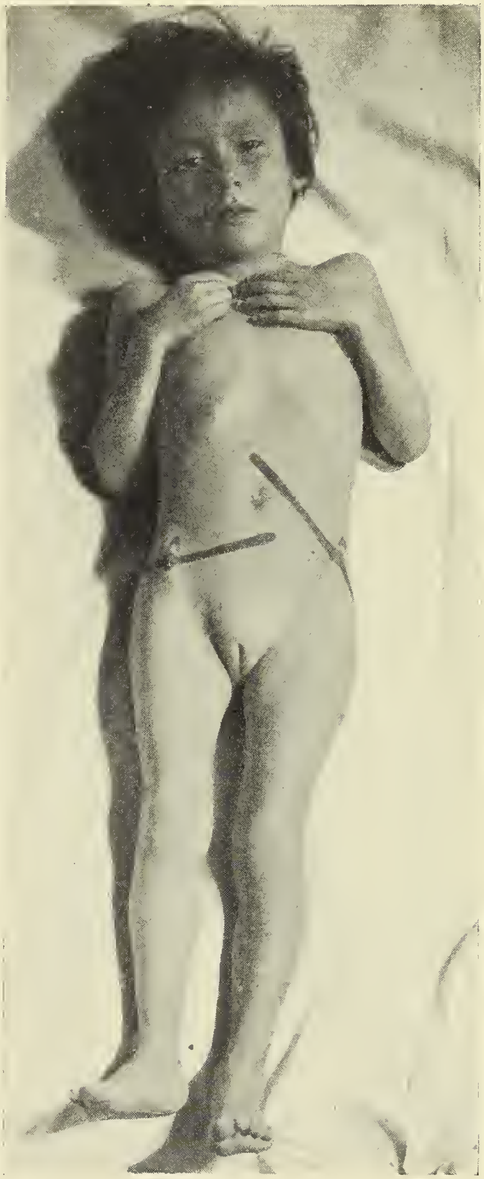

Figure 3. Shoemaker's line.

A line connecting the greater trochanter with the anterior superior spine if extended onto the abdomen crosses the mid-line at or above the umbilicus. If the hip is dislocated as on the right side in this illustration the line will cross the midline of the abdomen at a point below the umbilicus.

ing a psoas abscess. In this latter condition the only motion limited is that of extension. It is possible to flex the thigh beyond the deformed position as well as to rotate it throughout its normal range without pain. If the deformity is due to hip joint disease, motion if at all possible will be accompanied by pain. The limitation of motion will be present in all directions due to destruction of the articular surfaces of the bones, involvement of the ligaments and capsule, or deformity of the head of the femur or of the acetabulum.

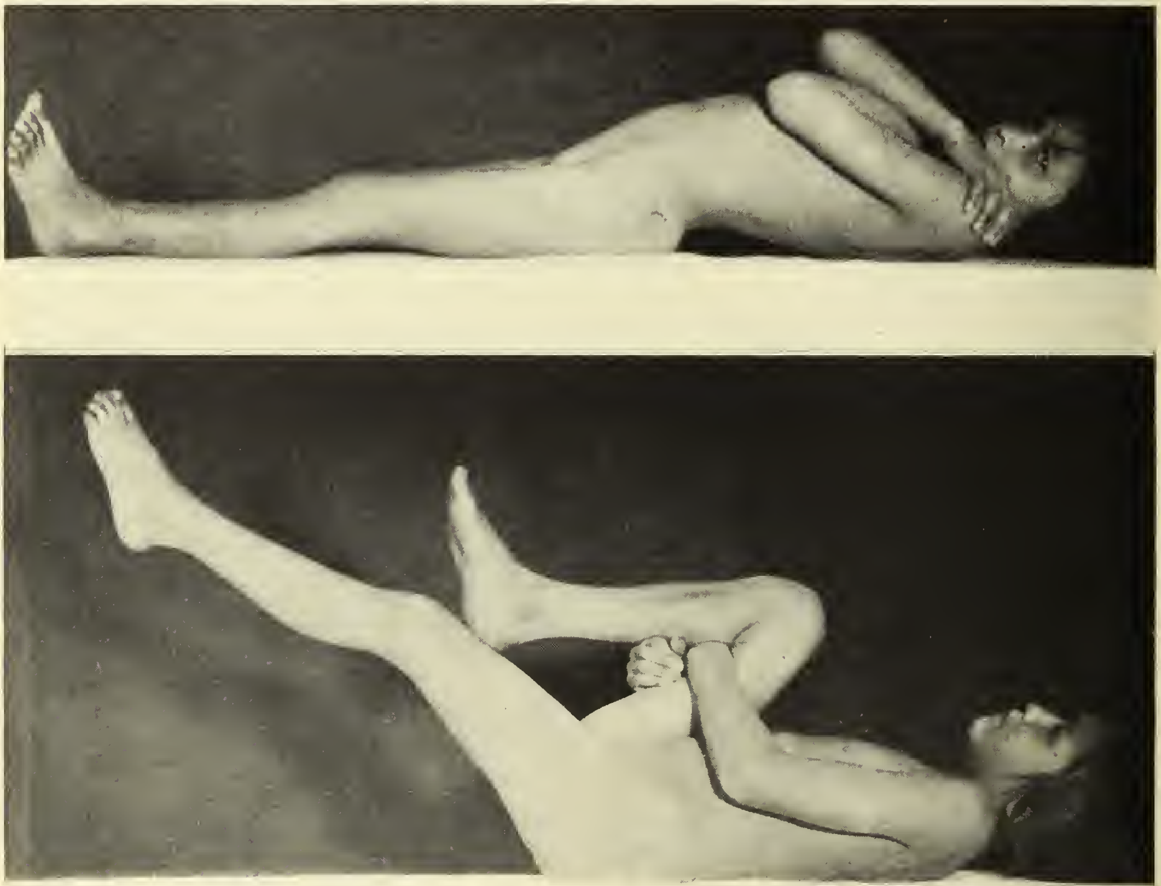

Figure 4. Thomas test for hip-flexion.

The patient is placed on the back flat on a table. If the legs are completely extended as in the upper view the lumbar spine becomes arched forward if there is a flexion deformity in the hip.

In the lower view the patient grasps the normal extremity with both hands, flexing it firmly against the abdomen, thus fixing the pelvis and flattening the lumbar spine.

The other extremity then assumes a position at an angle with the horizontal equal to the degree of flexion present in the hip.

Normally flexion of the hip is possible from the horizontal up to a point at which the thigh comes in contact with the abdomen if the knee is flexed. In deformity the hip may be stiff in any position inside this range. As the "position of optimum function" of the hip as regards flexion amounts to 10°-15° it is necessary to be able to determine whether an increase or decrease of flexion is present. It is true that many times one is able to judge fairly accurately the number of degrees of angulation. However, the goniometer or some mathematical table should be used for exact determinations.

The Thomas test for hip flexion should be understood as it is a prerequisite for accurate measurement of the degrees of angulation.

The great flexibility of the spine allows a patient to compensate for a marked flexion deformity of the hip, by increasing the normal mild lordosis in his lumbar spine (Fig. 1). If the flexion deformity is not marked it is often difficult to detect this compensatory adjustment. That it is impossible to extend the flexed ankylosed hip without producing lordosis in the lumbar spine forms the foundation for the Thomas test (Fig. 4).

The patient is placed in the horizontal position on his back on a table or other hard flat surface. A bed will not do. He is told to hold the normal leg flexed firmly against the abdomen, using both hands for this purpose. By this means the lumbar spine is held flattened against the table and

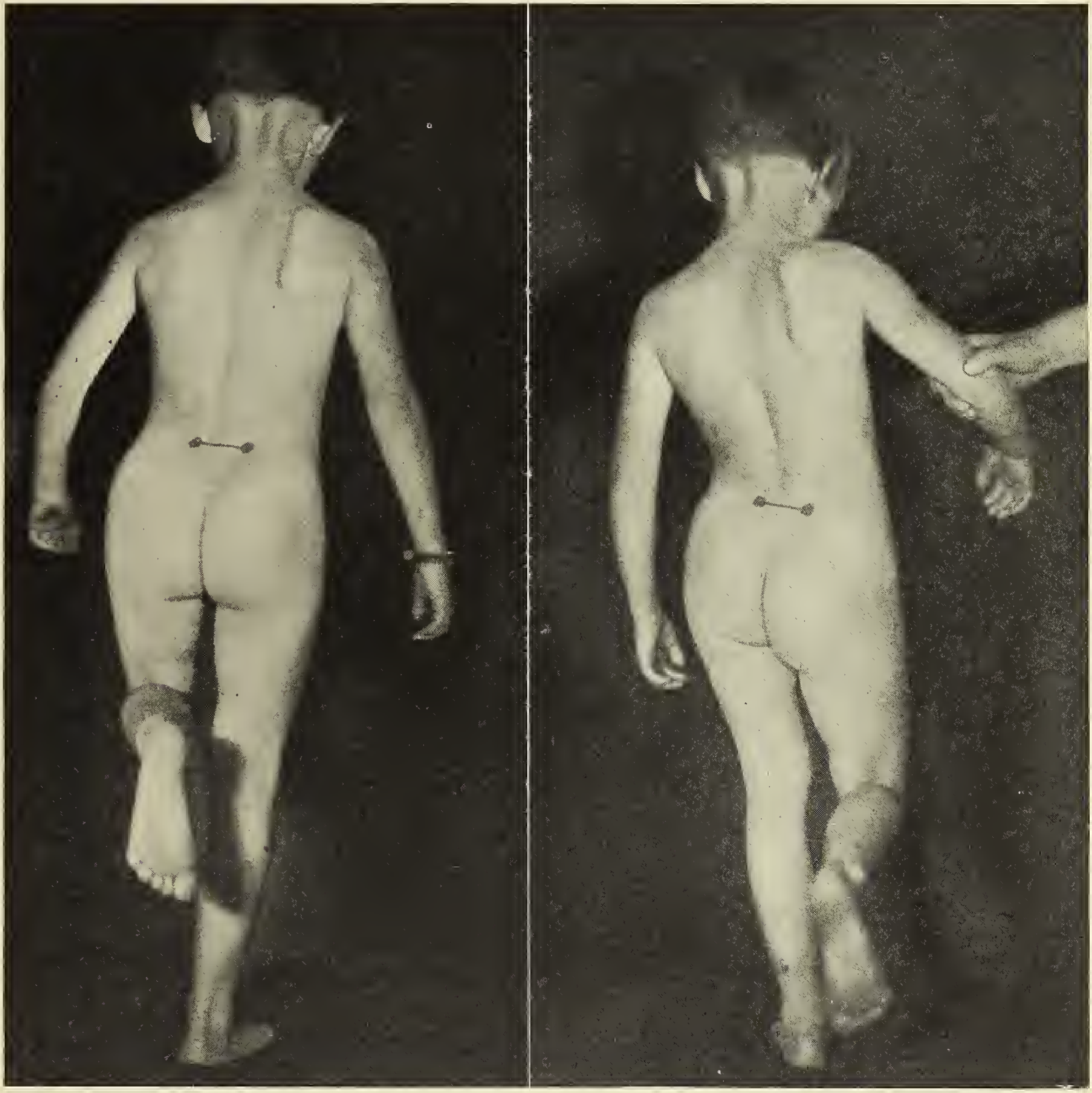

Figure 5. Trendelenburg sign.

A shows the patient standing on the normal extremity with the pelvis raised on the opposite side. Figure B shows how the pelvis drops when the patient stands on the dislocated extremity. The instability of the left hip makes it necessary for the patient to be supported when the weight is borne on the left leg.

The transverse line connects the posterior superior iliac spines.

the pelvis is fixed. The other extremity with the knee held straight assumes an angle with the horizontal equal to the number of degrees of flexion deformity in the hip. This angle may be measured by a goniometer or by taking the vertical distance to the table from a point on the leg 24 inches distal to the greater trochanter and consulting the table devised by Kingsley in 1888 for estimating the degrees of flexion. It is necessary to have ready access to Kingsley's table is one is to be able to utilize this method conveniently.

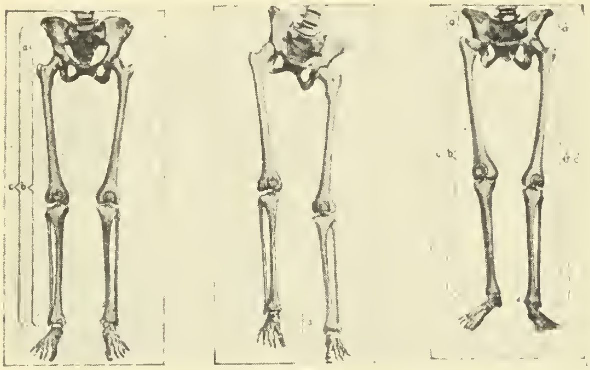

Figure 6. (From De Quervain's Surgical Diagnosis)

This is intended to show on the skeleton what is meant by apparent and real shortening. A is the distance from the greater trochanter to the level of the anterior superior spine previously referred to as Bryant's line. C is the measurement usually made from the anterior superior spine to the malleolus of the tibia and referred to as the actual length of the leg.

In the central figure the difference in the length of the legs produced by tilting the pelvis or adducting the extremity is shown. The actual length from the anterior superior spine to the malleolus is the same although the adducted leg is apparently shorter. The distance from the umbilicus to the malleolus on the right side is shorter than the distance between the same points on the left side. This difference is the apparent shortening.

The figure on the right shows real shortening due to a fracture of the neck of the femur. This shortening would be shown as a shortening of Bryant's line and a diminution in the distance from the anterior superior spine to the malleolus when the pelvis was held level.

In addition to being able to measure the amount of flexion deformity in a stiffened hip it may be necessary to determine the range of flexion in a partially stiffened hip. After flexing the normal thigh on the abdomen as in Thomas' test so as to fix the pelvis one is able to determine the degree of further flexion possible before resistance is met. By making measurements as described in Kingsley's table or using the goniometer, accurate readings of this range of motion may be obtained.

A word of caution may be inserted here relative to using the Thomas test in acute hip lesions. Due to the extreme degree of pain often present it is necessary that the affected limb be supported by the examiner when the normal limb is flexed to the abdomen

The Trendelenburg sign is a true indicator of the weight-bearing stability of a hip joint. Standing upon a normal extremity the opposite leg is raised from the floor by bending the knee. In order to keep the center of gravity of the body directly over the center of support, the pelvis is raised by the lateral abdominal and spinal muscles on the side of the flexed knee while the gluteal muscles on the weight bearing side immobilize this hip. If the hip is dislocated on the weight-bearing side it is impossible to obtain a fixed point for support, namely, the head of the femur in the acetabulum and the lateral abdominal muscles of the opposite side cannot function as before. As a result, the pelvis drops and the patient falls to the side away from the weight-bearing leg.

If both hips are dislocated this dropping of the pelvis on the side opposite to that of support is obtained when each extremity, in its turn, is raised. The patient has a bilateral Trendelenburg sign. It is not hard to see the effect upon the gait that this instability of the hip or hips would have (Fig. 5).

It might be well to mention at this point that a positive Trendelenburg sign is also obtained in at least three other conditions, namely: (1) coxa vara; (2) ankylosis of the hip in adduction; and (3) infantile paralysis involving the lateral abdominal and spinal muscles.

While on this subject of congenital dislocation Malgaigne's sign might be called to mind. The patient is placed on the normal side on the table with the affected hip and the knee flexed. The examiner grasps the uppermost extremity by holding the knee in one hand and placing his other hand on the buttock. One pushing dorsally in the long axis of the flexed femur a prominence is produced in the buttock. If only one lump is felt it is the greater trochanter and the hip is not dislocated. If two lumps are felt they are the head of the femur and the greater trochanter and the hip is dislocated.

It seems hardly necessary to attach a proper name to such an obvious finding but as the test may appear in the literature it should be mentioned at this time.

Shortening of the extremity may be actual or apparent. The differentiation between these two conditions is important and sometimes difficult to determine.

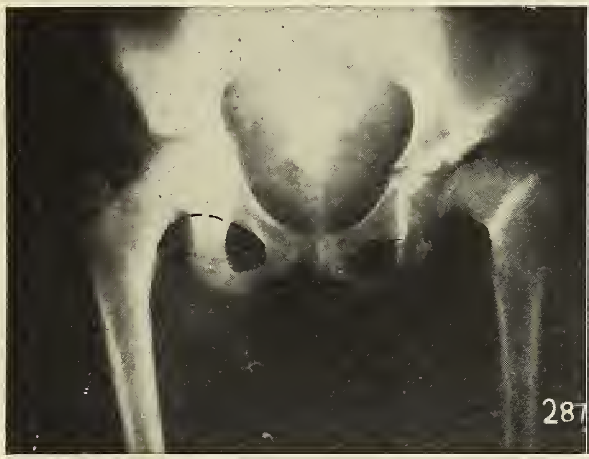

Figure 7. Shenton's line.

This is a moderately severe example of the distortion of Shenton's line in a case of coxa plana. The right hip is normal.

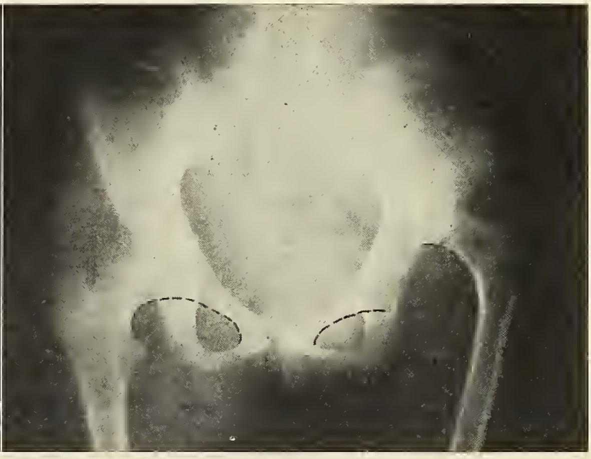

Figure 8. Shenton's line.

The distortion of Shenton's line found in dislocation of the hip is very marked, as shown in this view. The right hip is normal.

Before measuring the length of the legs one must be sure that the pelvis is horizontal in both planes and that both extremities bear the same relation to the perpendicular dropped from the line connecting the two anterior superior spines in so far as flexion, adduction and abduction are concerned.

The measurement is made from the under surface of the anterior superior spine to the tip of the medial malleolus or the sole of the foot and is probably more accurate if measured to this latter point.

Actual shortening is due to retardation of growth from disuse or disturbance of epiphyseal cartilage from congenital lack of development from disease, traumatic destruction, or displacement of the head of the femur or acetabulum.

Apparent shortening or lengthening is due to adduction or abduction deformities of the hip joint as the case may be. These apparent changes in length may be determined by measurement from the umbilicus to the medial malleolus of the tibia. If the hip is adducted the pelvis is tilted upward on that side so that the malleolus is brought nearer the umbilicus and an apparent shortening results. If the hip is abducted the pelvis tilts downward and apparent lengthening results. When the apparent shortening is greater than the real shortening the hip is adducted, and if the apparent lengthening is greater than the real lengthening the hip is abducted.

These measurements of apparent and actual shortening can be utilized to determine in degrees the extent of the adduction or abduction deformity of the hip. By taking the difference between the actual and apparent shortening and determining the width of the pelvis across the anterior superior spines one is able to use a table published by Lovett in 1888 to determine the number of degrees of adduction or abduction present. Here again it is necessary to have ready access to a table of figures in order to obtain the correct reading. Both the table and Kingsley's table mentioned above may be found in Whitman's Orthopedic Surgery or other similar textbooks (Fig. 6).

It is only by a special technic mentioned by Adams recently that one is able to measure adduction or abduction deformities on the radiograph. For all practical purposes it is not necessary to make an accurate measurement of adduction or abduction. If the anterior superior spines are joined by a horizontal line the degree of variation to either side from the perpendicular to this line can be estimated fairly accurately visually. The goniometer may be used if actual readings for purposes of record are desired. In the growing child the length of the legs changes rapidly when the hip is ankylosed in the adducted or abducted position due to the increase in the width of the pelvis. One is tempted to ask why so much care is taken to put the hip at a carefully predetermined angle for ankylosis so that the legs will be of the same apparent length, knowing that this apparent length will change very soon with the growth of the pelvis.

From the radiological standpoint one does not have so many signs or measurements to remember. Of course, the radiograph demonstrates conclusively such conditions as pathological changes in and about the hip joint, congenital dislocations, traumatic lesions and so on, but sometimes the involvement is so mild that unless there are definite points or lines to be used as landmarks, variations from the normal may be missed.

In 1911, E. W. H. Shenton described a line bearing his name which acts as a very useful guide in the radiography. This line drawn along the outline of the lower surface of the neck of the femur and the upper rim of the obturator foramen forms an unbroken sweeping curve. If, for any reason, the head of the femur assumes a higher position on the pelvis on one side than on the other the curved line is broken. This forms a reliable guide directing the attention to the abnormal hip (Figures 7 and 8).

A straight line passing through the center of the sacrum and the symphysis pubis furnishes a useful fixed median plane from which the degree of adduction or abduction of the hip joint can be estimated. Accurate measurement cannot be made for recording unless the radiographs are taken with a definite technic such as that described by Adams.

SUMMARY

1. A careful study of the gait and erect posture should be made with the patient stripped.
2. A description of a number of characteristic limps is given.
3. Various test lines are described and their significance noted.
4. The Thomas and Trendelenburg signs are described with illustrations.
5. The value of Shenton's line is illustrated.

THROMBO-ANGIITIS OBLITERANS*

REPORT OF FIFTY-TWO CASES

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A DISEASE of apparently increasing frequency, at least in its early recognition, and most insidious in onset, accompanied by varied manifestations which, in the early stages, tax to the utmost the diagnostic ability of the physician.

For various reasons we have for some time felt that it would be appropriate to informally discuss this disease and elucidate certain points which should aid in an early diagnosis.

After observation of individual cases over a period of years, both in the hospital and in the out-patient clinic at this station, we were impressed that too often the diagnosis is not considered in ailments of the extremities.

We have been impressed with the gradual development of the disease in the individual cases. As a result of our study of these in retrospect we feel that we can draw certain conclusions on subjective symptoms and objective findings in the early case.

Spontaneous gangrene of the extremities has been noted for years, as have also other less serious circulatory changes, but not with any clear understanding. Quesnay, in 1739, mentioned possible occlusion of the artery causing gangrene. Raynaud, in 1862, published his thesis "Local Asphyxia and Symmetrical Gangrene of the Extremities." Intermittent claudication was recognized. Von Winiwarter, in 1879, reported the first recognizable case and termed it endarteritis and endophlebitis. Since then, numerous cases have been reported, but it is difficult to determine the pathological classification in many. It remained for Buerger, in 1908, to elucidate the pathology, and his criteria stand today as the basis for positive diagnosis. Since then, interest in the condition has steadily advanced, and many cases are reported, with suggestions as to etiology, diagnosis and treatment.

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*Read before a joint meeting of the Hennepin and Ramsey County Medical Societies on October 30, 1929.

Brown, Allen and Mahorner have recently reviewed the subject most thoroughly.

The interest of one of the authors in the subject began in 1922, when he reviewed a series of amputations performed for this condition at the Boston City Hospital. To his surprise, he found that more than sixty per cent were of Irish extraction. As he looks back, he recalls that the diagnosis was made in the presence of gangrene and from pathological studies, and that early diagnosis was most rare.

That this state of affairs still exists cannot be denied. Many cases still go undiagnosed until major symptoms appear.

The opportunities afforded us to study the disease at this Clinic have been unusual, and we feel that a report, considering various means of diagnosis, is warranted at this time.

ETIOLOGY

The numerous suggestions as to etiology are evidence that as yet no single factor can be termed causative. It is, however, probable that infection is responsible. Rabinowitz claims to have isolated an organism which reproduced the lesion in rabbits, but his work has not been confirmed. English observers report the presence of a histamine-like substance in tissues, activated under certain barometric conditions, causing local changes similar to those in Raynaud's disease, and, if extensive, simulating endarteritis in its local end-stages. Typhus is mentioned. Only one of our cases had an indefinite history of this disease. Males are affected with only very rare exceptions. The use of tobacco and ergot have been discarded as anything but possible predisposing or aggravating factors. Buerger does not feel that exposure to wet or cold is a cause *per se,* but rather is an exciting factor predisposing to gangrene. We feel that foci of infection may play a part if local factors are favorable for the development of the disease.

PATHOLOGY

The pathology is not an endarteritis, but an occluding thrombosis affecting arteries and veins. This occlusion occurs usually in the deep vessels, but often is present in the superficial veins.

GROSS PATHOLOGY

The deep vessels of the amputated legs regularly show an extensive obliteration of the larger arteries and veins. Besides this, there are two lesions which vary greatly in their intensity—periarteritis, and, not infrequently, arteriosclerosis. The appearance of the vessels on gross section depends upon the age of the occluding process. Usually the vessel is seen to be filled with a grayish or yellowish mass that can be distinctly differentiated from the wall of the vessel, and that appears to be pierced at one or a number of points by an extremely fine opening through which a minute drop of blood can be squeezed. Such obturating tissue is firm in consistency, and does not at all resemble the crescentic or semilunar occluding masses typical of arteriosclerosis. The vessel itself is usually contracted, so that its wall appears somewhat thickened. This picture is characteristic of arteries or veins which are the seat of a very old obliterative process and is to be found most frequently in the peripheral portions of the vessels, although at times this type of lesion may extend throughout the whole length of the vessel, from the dorsalis hallucis into the popliteal artery.

The veins share equally with the arteries in the lesion of occlusion. In some cases they are more extensively involved than the arteries; this is particularly true of the collaterals of the posterior tibial, which are often closed when the anterior tibial veins are open. As for the arteries, we usually find an obliteration of a part or the whole of the anterior tibial, of the dorsalis pedis and of the dorsalis hallucis, an occlusion of the posterior tibial and plantar vessels, with or without involvement of the peroneal.

Besides the lesion of occlusion, there are two other striking changes, namely, a certain amount of arteriosclerotic thickening and periarteritis. Arteriosclerosis is absent in the younger cases; when present, it is never pronounced, except in those rare instances in which the patient has suffered from the disease for many years, and has reached the age of forty or over. As a rule, we note but very slight degree of whitening or thickening of the intima, here and there in the patent portions of the vessels. In a very few cases small atheromatous patches are present.

A much more interesting and more important change is the fibrotic thickening of tissues immediately about the vessels. Wherever the vessels are occluded, there is apt to be an agglutinative process which binds together the artery and its collateral veins and sometimes, also, the accompanying nerve, so that liberation of the individual vessel by dissection is difficult. The adhesive condition is due to fibrous tissue growth, and varies considerably in its amount. The periarterial fibrosis varies, sometimes being almost absent, at other times so great that isolation of the vessels or nerves becomes impossible and the vascular structures make up one dense rigid cord.

HISTOPATHOLOGY

The lesions may be considered in two stages: first, the healed or organized stage; second, the acute or incipient stage of thrombosis. Between the earliest alterations in the deep arteries and veins and superficial veins, and the final stage of the disease, there are a large number of intermediate pictures that illustrate the metamorphosis of the obturating clot into the intravascular cicatrix.

1. *Healed or Organized Stage.*—The most common lesion is a total obliteration of the lumina of arteries and veins by connective tissue. Histologically this may be extremely varied in the general appearance, but each picture can be interpreted correctly as having its origin in the lesion of occlusive thrombosis. This obturating connective tissue usually harbors numerous small vessels, pigment containing hemosiderin, and a fair amount of connective-tissue cells. The canalizing vessels, when they became dilated, form smaller or larger sinuses, giving the fenestrated or cribriform lesion seen on microscopic section of the vessels, or *when the canalizing vessel becomes eccentrically placed and sufficiently large, this sinus is responsible for the appearances which have been incorrectly interpreted as the product of an endarteritis obliterans.*

Elastic tissue stains demonstrate characteristic differences between this process and that of arteriosclerosis. Thus, the region of the organized clot is almost completely free from elastic tissue. The small amount which is present is concentrically disposed about the new formed vessels. The abundant elastic tissue formation in the arteriosclerotic plaques is well seen. A combination of thrombo-angiitis obliterans and arteriosclerosis is shown in some cases.

Still more suggestive and instructive is the finding of various stages of the disease in different members of the same vessel sheath. Thus, a large artery affords a view of the old lesion as well as one of its venæ comites. Another accompanying vein is in the "acute" stage of the disease, a smaller venule or satellite being in the intermediary stage, where certain "miliary giant-cell foci" make their appearance. Such pictures not only reveal the thrombotic nature of the disease, but also present an argument in favor of the following two assumptions: *that the disease begins with an inflammatory lesion attended with occlusive thrombosis, and that it affects the arteries and veins in a sort of relapsing fashion, very much in the same manner as the veins in migrating phlebitis.*

The termination of the occluding tissue in arteries and veins is often seen in the form of a rounded, convex projection looking upward (cephalad), and lying in seemingly healthy vessel wall. At other times, the old occluding tissue is capped by an additional clot rising in pyramidal fashion, ending by a long tapering extremity.

2. *The Acute or Specific Lesion.*—The early lesions are so characteristic histologically that their appearances are distinctly specific for thrombo-angiitis obliterans and perimt the pathologist to make a diagnosis of the disease. They are rarely to be seen in the deep vessels for the reason that patients do not allow amputation until the disease has lasted for months or years. However, they can be well studied when these are the seat of the typical migrating phlebitis, which has been shown by Buerger to be identical with the acute lesions in the deep vessels.

The earliest changes appear to be the usual evidences of an acute inflammatory process involving all the coats of the vessel. The media, adventitia, and perivascular tissues are infiltrated with polynuclear leukocytes, and the lumen of the vessel is completely filled with red clot. In the peripheral portions of the clot, large or small foci of leukocytes (purulent foci) begin to form, whose growth occurs by virtue of immigration of leukocytes. Certain peculiar and characteristic giant-cell foci then develop. They contain giant cells, endothelioid cells or angioblasts and numerous broken-down leukocytes. These foci then undergo connective-tissue replacement. The giant cells gradually disappear, numerous small vessels are formed, the final product being fibrous tissue containing vessels and some pigment. In the rest of the occluding clot the organizing process is somewhat different, resembling that which characterizes the organization of blood-clot in other thromboses.

In short, the lesions in thrombo-angiitis obliterans are, in chronological order: an acute inflammatory lesion with occlusive thrombosis, the formation of miliary giant-cell foci, the organization and canalization of the clot, the disappearance of the inflammatory products, and the development of fibrotic tissue in the adventitia that binds together the artery, vein and nerves.

(*Note.*—Much of the above description of the pathology has been drawn verbatim from Buerger's monograph.)

DIFFERENTIAL DIAGNOSIS

Before discussing the differential diagnosis in circulatory disturbances of the extremities, we feel that a few words relative to the reason why the neuro-psychiatrist should be interested in this subject might not be out of place.

The United States Veterans' Administration has classified the angioneuroses, for compensation purposes, under neuropsychiatric disabilities, and, therefore, all cases presenting symptoms that might point to these conditions are referred to the Neurological Section. These include Raynaud's disease, erythromelalgia, trench feet, angioneurotic edema, acroparethesia, multiple neurotic gangrene, scleroderma, sclerodactylia, chronic acro-asphyxia, and familial gangrene.

In addition to these conditions, many of the organic neurological diseases, especially those involving the spinal cord, have circulatory symptoms. In cases of recent total transverse lesions of the spinal cord the lower limbs are usually abnormally warm, the greatest change occurring distally. This is due to vasomotor paralysis. Erythromelalgia is sometimes one of the earliest signs of organic cord disease, such as disseminated sclerosis, and this points to its origin from an affection of the spinal vasomotor centers, probably the nucleus sympatheticus lateralis between the anterior and posterior horns. Again, many patients with circulatory disease present early symptoms simulating neuritis and neuralgia. In addition, there may be traumatized or severed peripheral nerves, with ulceration, such as is represented in one case in our series, where the sciatic nerve was severed by a gunshot wound. Circulatory disturbances are common in peripheral nerve injuries, and frequently an artery is injured at the same time as a nerve.

Since thrombo-angiitis obliterans represents the largest disease entity in our group of circulatory disturbances, it must be differentiated from the other circulatory conditions. The conditions to be differentiated are placed in two large groups:

1. Organic vascular diseases of the extremities.
2. Cases of neuropathic or neurogenic vascular disorders.

Under the heading "Organic vascular diseases of the extremities" must be considered diabetic gangrene, arteriosclerosis, aneurysm, embolic or thrombotic gangrene, luetic endarteritis, peripheral nerve injuries, with or without blood vessel injury. In addition to these organic vascular diseases there are a few other diseases that have symptoms that occur in thrombo-angiitis obliterans, namely: myositis, metatarsalgia, neuritis, neuralgia, various cord diseases, pes planus, pes cavus and thrombo-phlebitis. Practically all of these conditions have claudication as a symptom.

The neuropathic or neurogenic disorders to be differentiated are: Raynaud's disease, erythromelalgia, trench feet, angioneurotic edema, multiple neurotic gangrene, scleroderma, sclerodactylia, chronic acro-asphyxia, familial gangrene.

For the clinical diagnosis of thrombo-angiitis obliterans, we must depend upon:

1. Sex—male predilection.
2. Early involvement of the lower extremities.
3. Early symptoms of claudication or pain.
4. Migrating phlebitis.
5. Pulseless vessels.
6. Blanching of the extremities in elevated positions (angle of circulatory efficiency).
7. Rubor in dependent position.
8. Relation of hyperemia phenomena to posture.
9. Slow process, chronic course, keeping in mind that some cases have spontaneous arrest.
10. Absence of simultaneous symmetrical involvement.

Diabetic gangrene is differentiated by the presence of sugar in the urine, hyperglycemia, and other associated signs of diabetes, with gangrene.

Arteriosclerosis is determined by the age of the patient and the condition of the blood vessels in general and evidence of generalized arterial disease not limited to the periphery.

Aneurysm presents a bruit and a history of syphilis or trauma with findings for the same. Serological study is of value here.

Embolic or thrombotic gangrene is associated with a history of infection or heart disease, with sudden onset for the former and a gradual onset from infected foci for the latter.

Luetic endarteritis: serology and associated manifestations of syphilis.

Peripheral nerve injuries with circulatory disturbances are differentiated by presence of motor paralysis or loss of sensation following an injury.

The associated conditions, such as myositis, metatarsalgia, neuritis, pes planus and pes cavus, are differentiated on the basis of symptoms characteristic of these conditions. The most difficult differentiation is in neuritis, especially in the irritative stage, as many of the endarteritis cases have extreme tenderness over the nerve trunks, especially in the distal portions of the extremities, and before occlusion of arteries occurs many of these cases are wrongly diagnosed neuritic.

Any type of foot strain can cause claudication, and this symptom is one that gives considerable trouble in differential diagnosis.

In differentiating thrombo-angiitis obliterans from the angioneuroses, the following points may be of assistance:

Raynaud's disease. The mildest degree of this is local pallor ("local syncope" or "dead finger"), where the affected parts, usually the fingers, less frequently the toes, the edges of the ears, or the tip of the nose, suddenly become cold to the touch and of a waxy white color. Together with this, the patient feels a tingling or peculiar sensation (acroparesthesia). Actual blunting of sensation to touch may be present. One or both hands may be affected, sometimes identical fingers in both hands; the thumb is less often affected than the other digits. The attacks last from a few minutes to several hours and are commonest in winter. They are often brought on by washing the hands in cold water, or by fine digital movements such as in sewing or piano-playing. As the attack passes off, the patient feels a sensation of tingling or even of pain. A more severe variety is that of local asphyxia or cyanosis, in which the affected digits suddenly become discolored, varying in tint from a dusky blue or slate color to an intense purplish-black. Pressure on the discolored area causes a white mark which persists for several seconds, before the lividity slowly reappears. The pain is usually more intense than in local syncope. As the attack passes off, the affected part often sweats freely. But the most severe variety of Raynaud's disease is symmetrical gangrene, which is usually preceded by local asphyxia and sometimes by local syncope. As a rule, the gangrenous process is confined to a small part of the cyanosed area. In its mildest form the necrosis is limited to the epithelium, so that only desquamation results. More often a small blister forms, with blood stained contents. This bursts, leaving an ulcer with subsequent scar tissue. The nails may be lost temporarily, or the necrosis may extend deep into the tissues, forming a dark slough. Whole phalanges may undergo dry mummification and be cast off, leaving a conical stump, with the bones escaping early necrosis. Pain is usually severe during the initial cyanosis.

The symptoms of Raynaud's disease are due to local spasm of the vessels, their sudden onset and disappearance being incompatible with any other hypothesis. The coexistent sensory symptoms are probably due to imperfect blood-supply. A paroxysm of local syncope or cyanosis can usually be relieved, as Cushing has pointed out, by applying a tight flat rubber tourniquet around the limb above, so as to occlude all the vessels, both arteries and veins, and leaving it on for several minutes. When the tourniquet is taken off, there is a temporary vasomotor paralysis, the whole limb flushes to the finger tips, and a wave of redness wipes out the local pallor or cyanosis. In rare cases paroxysmal impairment of vision has been noted, and during such attacks the retinal arteries on ophthalmoscopic examination have been seen to be spasmodically contracted. In paroxysmal hemoglobinuria, Raynaud's syndrome is constantly present, to a greater or less degree.

In striking contrast with Raynaud's disease is the condition known as erythromelalgia, which usually attacks one or the other foot. There is pain of a burning or stabbing character, often of excruciating severity, occurring in paroxysms, lasting from a few minutes to several hours. This pain is always aggravated by dependent posture of the limb, by voluntary movement, or by warmth, whereas it is diminished by a horizontal or elevated posture, by rest, and by cold applications. The earliest attacks consist simply of pain. As the disease progresses, however, redness and swelling of the foot occur in addition; more rarely, redness precedes pain. The redness is of a bright tint, often confined, for instance, to the ball of the big toe or to small areas of the sole or edge of the foot. Sometimes it is diffused over the foot. The redness increases in intensity, and if the limb be allowed to hang down, the "vascular storm" continues, with bounding arteries, local rise of temperature and intense cutaneous hyperesthesia. As the attack subsides the redness is replaced by cyanosis.

There are other cases in which the vasomotor symptoms are intermediate in type between the two extremes of Raynaud's disease and erythromelalgia. These two diseases may coexist, or may succeed each other in the same patient.

Among soldiers defending sodden trenches in the winter season, as in the World War, there occurred numerous cases of trench-foot. Very few of the cases, however, were due to actual frost. True frost-bite, which is usually the result of intense dry cold, is characterized by suddent, massive tissue-death of the tip of an extremity, whereas trench-foot has a progressive invasion of the tissues, and when it shows gangrene does so in circumscribed patches. The factors producing trench-foot are prolonged exposure of the feet to cold, muck, and thawing snow, want of exercise of the leg muscles, together with prolonged constriction by tight putties and boots which undergo shrinkage when soaked. The signs are primarily vascular in origin, to which may be superadded the sensory phenomena of a peripheral neuritis. The toes become cold and pale, in some cases cyanosed and in rarer cases gangrenous. There is slight impairment of cutaneous sensation in the toes, with considerable pain and tingling. At the outset the peripheral arteries of the feet are tightly contracted, and there is a local rise of blood pressure in the legs, which can be measured with a manometer. The vascular spasm produces local ischemia, with numbness and pain. When the surrounding atmospheric temperature rises, the vessel-walls become relaxed and even paralyzed, so that vascular dilation occurs, with exudation of serum into the tissues through the damaged capillary walls. Thus edema of the feet may supervene, and in severe cases is associated with excoriation and secondary infection of the skin. This edema may extend up to the knees. As the circulation begins to return, the pain becomes aggravated, and even after the circulatory phenomena have apparently recovered, pain may persist, with characteristic signs of peripheral neuritis. This is shown by the combination of impairment of sensation to light touch together with intense hyperesthesia on pressure, so that for weeks the patient may be unable to stand or walk, owing to pain in the soles of the feet, especially anteriorly.

Angio-neurotic edema is differentiated by paroxysmal attacks, lasting a few hours, of sharply defined, localized, hard edema, occurring in the cellular tissues of the face, lips, eyelids, trunk or limbs. The swelling is firm, does not pit on pressure, passes off spontaneously or after the sub-cutaneous injection of adrenalin. It may attack the mucous membranes of the respiratory tract.

Multiple neurotic gangrene of the skin is a dermal process in which vasomotor constriction is not limited solely to the extremities, but to isolated patches of skin. It occurs in hysteria and schizophrenia. The disorder sets in with burning and prickling sensations of the skin and then, after a variable length of time, a few minutes to hours, swelling occurs, and blisters form; later necrosis. At times only a circumscribed edematous bleb occurs.

Scleroderma is a progressive induration of the skin occurring in circumscribed patches. The skin is hard and pigmented. Destructive changes may occur even resulting in periarticular immobilization of joints.

Sclerodactylia, a disease of fingers or toes, allied to scleroderma, occurs in women, and leads to deformity.

Acro-asphyxia is an asphyxia of the extremities of a chronic nature, without other involvement.

Familial gangrene resembles Raynaud's disease somewhat, and the following description by Purves Stewart is classical:

> "Three brothers, aged five, four and three years, respectively, in all of whom, one winter, there developed local necrosis of the feet. The oldest child had necrosis of the skin of both heels, followed by similar areas on the dorsum of the right foot and on the fourth left toe. The second child had cyanosis and some necrosis of the dorsal surfaces of both feet, whilst the youngest had severe necrosis of the dorsal surfaces of both feet, of the hallux, fourth and fifth toes on the right side, and a smaller area of necrosis on the plantar surface of the left hallux."

In working up our group of cases we have used a modification of the data sheet proposed by the Mayo Clinic and the cases have been reviewed under the following headings: Name, age, sex, nationality and birthplace, family history of vascular disease, smoking habits, past diseases, precipitating factors and claudication,—location and severity of rest pain and how it is relieved, the presence or absence of color changes followed by a summary of progression, including vasomotor disturbances whether local or general, whether accompanied by phlebitis, thrombosis, ulcers or gangrene. Prior treatment, prior diagnosis and a chronological history of surgical procedures were noted.

The following diagnostic points were stressed in our examinations: Palpation of the main arteries of the legs and arms, graded on the basis of four. The observation of dependent rubor, elevated pallor and edema was made and noted. Gangrene, if present, was, of course, noted. Attempts were made to produce claudication and rest pain. In some cases hot and cold water tests were used. The temperature of the extremities was noted as compared with the normal skin temperature. In all cases recently under our observation we have used a test which we have termed the Allen Test in which (after a blanching has been produced in the elevated position) and one or the other of the large vessels to the extremity is blocked off by digital pressure, the extremity is lowered and an observation of the collateral circulation is made.

Every patient had routine physical and laboratory examinations and such special examinations as seemed indicated.

A review of the pathological files of the hospital, including the out-patient clinical material for the past ten years, shows sixty-three cases of circulatory disturbance in the extremities, of which fifty-two have been classified as thromboangiitis or endarteritis obliterans. We have not included in this list any cases of frank arteriosclerosis or luetic endarteritis, although there are some of the cases diagnosed endarteritis which have been placed in discard because of the possible presence of more obvious conditions. These cases constitute eleven which are diagnosed as follows:

Raynaud's—2.
Epidermophyton—1.
Diabetic Arteriosclerosis—3.
Trench Frostbite with a Healed Amputation—1.
Circinoid Aneurism of the Radial Artery Followed by Amputation—1.
Arteriosclerosis with Diagnosis of Thromboangiitis Obliterans—2.
Sciatic Nerve Injury with Ulcer and Amputation—1.

A brief summary of the remaining 52 cases follows:

Ages at onset range from 19 to 38 years with one case each of 51 and 60 years of age. Duration of disease ranges from two to twelve years (average duration eight years and nine months).

Nationalty:	Jewish	14
	Celtic	20
	German	8
	Scandinavian	6
	Latin	3
	Undetermined	1
		—
		52
Smokers:	Mild	1
	Moderate	23
	Excessive	12
	Non-smokers	8
	Unknown	8
		—
		52

POSSIBLE ETIOLOGICAL FACTORS

Exposure in service, foot and leg strain	4
Trench warfare associated with severe exposure to the elements	22
Cold	6
No service exposure	14
Dental caries	19
Rheumatic infections of various types	13
Nose and throat infections	14
Pulmonary infections, including tuberculosis	12
Prostatitis	9
Amebiasis and other gastro-intestinal infections	10
Typhoid	2
Hypertension	1
Acoholism	1

Positive blood Wassermanns were found in five cases, in four of which, despite progression of endarteritis symptoms, all serological tests were negative for the past year after intensive treatment.

As evidence of the difficulty in diagnosing these conditions, which difficulty was pointed out earlier in this paper, it is interesting to review some of the earlier diagnoses which these cases carried:

Pes planus	19
Circulatory disturbances	8
Metatarsalgia	8
Varicose veins	3
Rheumatism	7
Neuritis	5
Raynaud's disease	6
Myositis	1
Trench feet	5
Acrocyanosis	1
Luetic endarteritis	3
Tuberculosis of the bone	1

The type of progression in these cases is interesting from a standpoint of prognosis.

Forty of the series could be classified as slow progression, two as sudden and ten as recurrent with severe manifestations. Thirty-nine cases presented a history of claudication classified as: none mild, twenty-two moderate, and eight severe. Rest pain was present in thirty-four cases. Easy fatigue was present in forty-two cases. Color changes were present in forty-one cases. Thrombosis of the main arteries was present in fourteen cases, not all of which required surgical interference, and phlebitis was present in twelve cases. Gangrene was present in seventeen cases, classified as: Ulcers—7; moderate gangrene, that is, of the toes—5; severe gangrene—5.

Simple amputations were done in two cases and repeated amputations were done in twelve cases. Two cases had peri-arterial sympathectomy, one followed by amputation later; the other done a year ago and not traced. Three cases are included in this series on an old diagnosis on which we have no recent data. Two have had ganglionectomy with some relief of pain. All cases with mild and moderate symptoms have had various forms of physiotherapy and repeated courses of intravenous typhoid vaccine. What do the above facts indicate, but that the condition is being recognized early, that it is much more insidious and slower than usually thought to be, and that conservative measures have proven of some palliation in those cases of slow progression?

Whereas, many of our patients have been given treatment of various kinds, notably the relief of abnormal static demands by orthopedic measures, physiotherapy, Bier's hyperemia, and postural exercise, the clinic facilities, until recently, were such that typhoid therapy and tests of the vasomotor index could not be done routinely. These are finer methods occasionally necessary for diagnosis and the evaluation of cases suitable for lumbar sympathectomy.

CONCLUSIONS

1. The differential diagnosis of circulatory disturbances of the extremities calls for most careful examination and evaluation of findings.

2. Thrombo-angiitis obliterans can and should be recognized early.

3. Our series demonstrates no specific etiology, but strongly suggests lowered local resistance following exposure, with superimposed infection.

4. There are at present no criteria on which prognosis can be based. Most cases are slowly progressive, but may be subject to sudden severe flareups.

5. Treatment of the mild cases should be palliative. Surgery offers the only relief in severe cases.

6. No conclusions are made regarding foreign protein therapy, except that it offers temporary palliation.

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SKIN TESTS IN CHRONIC ULCERATIVE COLITIS*

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THE value of intradermal injections in the study of certain infectious diseases has been generally accepted. Rosenow has suggested the importance of skin tests in various infectious diseases.

Local reactions from such procedures have been noted to vary as individual resistance has changed, either from active or passive causes, or in accordance with a person's native immunity to infection. The work of the Dicks excellently illustrated this feature.

Since the early studies of Koch and von Pirquet, cutaneous reactions in tuberculosis have become common knowledge. Here is, in addition to the phenomenon of immunity, the often superimposed one of allergy. Because of the intimacy with which the two are associated in this particular instance, there is a general tendency to think of the two conditions as synonymous. However, this is not a true conception, as has been definitely proved by Rich and his collaborators. He stated "acute inflammation is a protective mechanism, but it does not follow that an enhanced capacity for reacting with inflammation (allergy) is always necessary for protection."

Dorst and Morris for several years have been interested in skin tests and their use in explaining the clinical pictures of spastic or irritable colon and mucous colitis on the basis of hypersensitivity of the enteric tract to certain bacteria. They have noted very encouraging results from desensitization with autogenous vaccines made from cultures of organisms which were obtained from the stool, and which gave positive allergic skin reactions.

Anaphylaxis may be present in the development of immunity in infectious disease, but not necessarily so. Yessner has shown that in experimental sporotrichosis allergy develops, but rapidly disappears, and that the animal then enjoys perfect acquired immunity.

It is not within the scope of this study to attempt to determine the relationship of allergy to immunity. Our particular interest lies in the problem of immunity in chronic ulcerative colitis, and although hypersensitivity at times has been an early, more or less prominent factor, results of skin tests applied to persons afflicted with this disease have been such that certain deductions have been warranted.

The antigens used for the intradermal injections were prepared by Rosenow, and represented a suspension of 200,000,000 organisms for each cubic centimeter of physiologic sodium chloride solution, preserved with 0.2 per cent phenol. As many as fifteen different antigens were injected into a single patient, but the antigens in which we were particularly interested were those of the diplostreptococcus of chronic ulcerative colitis and two other organisms found in cultures of material from the rectum and sigmoid; namely, Streptococcus fæcalis, and enterococcus. The last two were included because of their similarity to organisms of chronic ulcerative colitis. The three organisms, although similar, exhibit strikingly different characteristics. Not only do they have different cultural characteristics, but, as Zozaya has demonstrated, from each a specific polysaccharide can be isolated.

The injections of 0.05 c.c. of each antigen were made intradermally, on the volar surface of the forearm, and readings were made at various intervals following injection, but the most satisfactory interval was found to be twenty-four hours. Rarely did a typical allergic reaction occur, and when present was noted within thirty minutes after injection of the antigen.

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Absence of, or merely slight, redness surrounding the needle puncture was recorded as negative. The reactions were graded. Redness, and a variable but usually slight swelling, limited to the blistered area, up to 0.5 cm. in diameter, was graded 1; a reaction from 0.5 to 1 cm. in diameter was graded 2; a reaction from 1 to 2 cm. in diameter was graded 3, and a reaction 2 cm. or more in diameter was graded 4 (Fig. 1).

In the course of three months, fifty-seven patients who had the clinical and laboratory manifestations of chronic ulcerative colitis were given injections. Seven of these patients were in the second decade of life; twenty in the third; fifteen in the fourth; eight in the fifth and five in the sixth or a later decade. In accordance with the figures of others, and our own, the ages at which the disease is most prevalent are between twenty and forty years. In this group there was no attempt whatever at selection of cases because of any clinical factors of age, sex, or laboratory findings other than those consistent with correct diagnosis. For example, patients who had as many as twenty bloody rectal discharges daily, anemia (hemoglobin as low as 22 per cent), and symptoms for as long as seventeen years were observed in turn, just as those who had only three or four stools daily, no demonstrable anemia, and a year or less of trouble. There were thirty-two males and twenty-five females.

As many patients as possible were tested before treatment with antibody globulin solution. In this treatment, the initial dose of 0.1 c.c. was increased by 0.2 c.c. daily until the usual maximal amount of 3 c.c. for each injection was attained. Occasionally, the local and general reactions of the patients required some modification of this routine, making it necessary to proceed more slowly. Skin tests were again made after a series of such injections, frequently at the time of dismissal.

For comparison, ten healthy persons between the ages of twenty and fifty years were tested. The diplostreptococcus of chronic ulcerative colitis, the Streptococcus fæcalis and the enterococcus, in the usual concentrations, were used as antigens. A control of 0.2 per cent phenol in sodium chloride solution was used in each instance. The reactions were graded as follows: in two cases, grade 2; in five cases, grade 3, and in three cases, grade 4.

All patients who had chronic ulcerative colitis, with the exception of seven, exhibited local skin reactions, of varying intensity, to the diplostreptococcus of chronic ulcerative colitis, or to Streptococcus fæcalis, or to the enterococcus or to all. The seven patients were those who gave no local reactions whatever to the antigens mentioned, and will be referred to later. The skin reactions of the remaining forty-nine patients were not constantly commensurate with the gravity of the disease. Such factors as anemia, number of stools, fever, duration of disease, or remote previous treatment showed no constant tendencies to modify the reactions in any way.

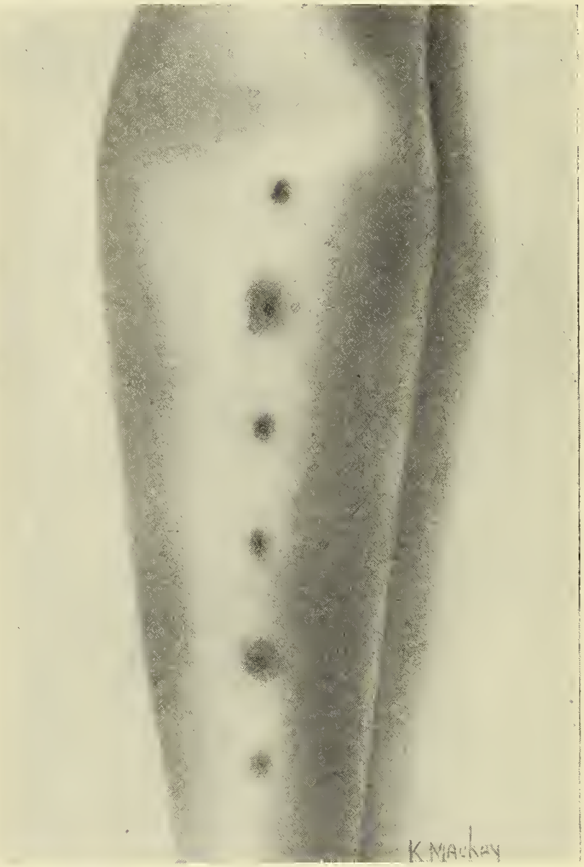

Fig. 1. The size and extent of the wheal after intradermal injection of the organism to which the patient was sensitive.

It was possible to follow the twelve cases noted in the table more closely than the others.

Of these twelve cases, in every instance in which the skin tests were negative following treatment, after there had been a positive reaction before treatment, there was unquestionably definite and marked improvement in the patient's condition. The intensity of the preliminary test gave no indication of the possibility of later negative reactions.

RESULTS OF TREATMENT WITH ANTIBODY GLOBULIN SOLUTION

Case	Reaction before treatment, grade	Duration of treatment, days	Reaction after treatment, grade	Hospitalized	Stools, daily	Hemoglobin, per cent	Duration of disease, years	Progress
1	1	42	0	No	6 to 8	65	4	Clinical cure
2	3	30	0	Yes	7 to 8	60	3	Clinical cure
3	2	72	2	Yes	7 to 10	47	1.5	No improvement
4	2	24	1	No		64	4	Improved
5	2	11	0	No	20 or more	72	5	Clinical cure
6	2	48	0	Yes	20	22	2.5	Clinical cure
7	3	17	0	No	6 or more	56	3	Markedly improved
8	2	28	0	No	6 to 8	77	8	Markedly improved
9	0	33	2*	Yes	4 to 6	54	3	Markedly improved
10	1	25	0	No	10 to 12	81	13	Markedly improved
11	4	21	4	No	5 to 6	76	1.5	No improvement
12	3	27	2	Yes	15 to 20	44	8	Flare-up with tonsillectomy at second test; doing well up to that time

*Test made on patient's return, after seventy-nine days at home, during which time he had mild exacerbation of his trouble associated with perirectal abscess.

If, after a course of treatment usually adequate for good results, the skin tests remained positive to a degree similar to that before treatment, there was little if any clinical improvement. Cases 3, 11 and 12 illustrate this. In case 3, antibody globulin solution and some vaccine were given over a period of seventy-two days, without there being appreciable change in the clinical condition, and with no change in the cutaneous reaction. The interesting feature about Case 12 was that the patient began to show encouraging signs of improvement for three weeks after entrance to the clinic, and until she underwent tonsillectomy. This episode caused a severe flare-up of the colitis and at the same time the skin tests became positive, but with less intensity of reaction than formerly. Cultures from this patient's tonsils reproduced most severe ulcerative colitis in rabbits. In Case 11 there were marked initial reactions, graded 4; treatment for three weeks caused no change in clinical condition or skin tests. Recent correspondence with this patient disclosed that she was continuing to do poorly.

The patient in Case 9 did very well on his first visit to the clinic. His skin tests were negative before he received any serum whatever. But after an absence of seventy-nine days, he returned with an exacerbation of the old condition, probably incited by a local infection about the anus. At this later time, skin tests were definitely positive, graded 2.

The number of days of treatment between the original skin tests and the second tests varied (table). In Case 5 there was unusual improvement in eleven days, at which time skin tests were negative. On the other hand, in Case 6, forty-eight days of treatment were required before clinical cure supervened.

It is possible that the skin tests in many instances were actually negative long before a second test was done. Instead of doing frequent tests on these patients as treatment continued, and possibly stopping administration of antibody globulin solution as soon as the tests became negative, we did our second tests when the patient had made definite improvement or had shown little if any tendency toward betterment.

Of the original fifty-six cases, the initial cutaneous reactions were negative in seven. The first of these patients had had full doses of antibody globulin solution for four weeks before the initial test; the condition was excellent at the time of the test. The second patient had had full doses of antibody globulin solution for four weeks before the tests; the condition was improved markedly at the time of the tests. The third patient had had no treatment with antibody globulin solution, but had had three years' rest in bed;

the condition in the bowel was well localized. The fourth patient had received antibody globulin solution and vaccine on previous visits to the clinic, and returned merely for re-examination, in very good condition. The fifth patient had received vaccine elsewhere, and, although markedly improved, came to the clinic for evaluation of the condition; the general condition was very good. The sixth patient had received antibody globulin solution on previous visits and vaccine at home; the condition was very good. The seventh patient had received antibody globulin solution and vaccine previously, with excellent results.

The third patient is represented as Case 9 in the table.

The clinician finds it difficult to evaluate individual resistance to the infection in chronic ulcerative colitis. The mental attitude of the patient is capable of markedly changing the picture. Now, if it is possible to estimate by a series of innocuous skin tests how the case is progressing, an important step in the standardization of the treatment of chronic ulcerative colitis has been taken.

It is easily seen (table) that the tests become negative in some cases sooner than in others. In other words, there is undoubtedly individual variation in the protective qualities, and the amount of antibody globulin solution necessary to bring about general clinical improvement in one case may be entirely inadequate in another. The question naturally arises as to the feasibility of controlling the amount of antibody globulin solution to be given, by means of skin reactions.

This study furnishes additional data supporting our contention that the disease is of specific etiology. If a substance such as the antibody globulin solution is introduced in the treatment of these patients, and there is consequent complete negation of skin reactions, the substance appears to be a specific agent. Administration of this antibody globulin solution seemingly has been the chief factor in effecting increased resistance and clinical betterment in the cases observed. It is to be hoped that this study may lead to a more definite prediction of the length of time over which a patient should receive specific treatment.

In two cases, now to be reported, the effect of treatment and the results of skin tests were as nearly opposite as could be.

Case 1.—A married man, aged twenty-eight years, had had no intestinal trouble of any kind until May, 1924, when he had diarrhea of rather sudden onset. At first there were only two to three loose stools daily, with occasional streaks of blood. The number of stools increased in frequency until, at the time he entered the clinic in August, 1930, he had five to eight soft, bloody discharges daily. Between the time of onset and August, 1930, more than seven years, many forms of treatment, including a vaccine made from organisms cultured from his stools, had been tried without beneficial results.

The patient was fairly well nourished, and was able to be up and about. Physical examination was negative except that a tender, rope-like mass was palpable in the left lower abdominal quadrant. The mucosa of the rectum and sigmoid was glazed and granular. Bleeding occurred with slight trauma. The lumen had become contracted, losing about a third of its usual diameter. The concentration of hemoglobin was 60 per cent, erythrocytes numbered 4,220,000, and leukocytes 7,600 in each cubic millimeter of blood. Diplostreptococci of ulcerative colitis were isolated from cultures of the rectal mucosa, and the roentgen diagnosis was chronic ulcerative colitis involving the entire colon, apparently active. In spite of these observations, the patient decided to go home without treatment. At home he continued to have five to six stools daily until a few months before he reëntered the clinic, when their number increased to about ten daily, and his ability to control them decreased.

May 25, 1931, the patient registered at the clinic again. At this time he was noticeably pale and weak, and showed evidence of recent loss of weight. May 27, 1931, he weighed 106 pounds. Antibody globulin solution, 0.1 c.c., was given intramuscularly. The amount of antibody globulin solution was increased by 0.2 c.c. daily until he was getting about 3 c.c. By June 12 his weight had increased to 113.5 pounds, the number of stools had decreased to as few as three in twenty-four hours, and his strength had increased remarkably. Intradermal tests were made before treatment was begun, and the reaction was graded 3. After thirty days of treatment the skin tests were all negative and the patient was ready to go home in very good condition.

In those cases in which treatment has accomplished little if anything, the skin tests have continued positive. To try to explain why the antibody globulin solution does not give complete relief to all is not within the scope of this paper. However, it is suggested that the ulceration and destruction present, irrespective of the infection, might account for any failure. If the skin tests continue positive after a thorough course of treatment, the question arises if improvement can come from prolonging the injections of antibody globulin solution. This study suggests a negative answer to this query. However, further observations and follow-up studies will be necessary before the answer can be definite.

Case 2.—A single man, aged twenty-two years, came under our observation May 25, 1931. In August, 1929, the patient first noticed blood and mucus in the stools; this continued for three days. A similar episode occurred in October, 1929. In February, 1930, he passed eight or more bloody stools daily. Since that time he had been miserable with abdominal cramps, weakness, and bloody rectal discharges. He was in the hospital five weeks, without improvement, before he came to the clinic.

There was a palpable, tender, cord-like mass in the lower left abdominal quadrant, which seemed to be the descending colon. On sigmoidoscopic examination, the mucosa of the rectum and sigmoid was granular, glazed, and bleeding. The lumen was contracted, so that about two-thirds of its normal diameter remained. Roentgenograms of the colon gave evidence of chronic ulcerative colitis involving the bowel distal to the hepatic flexure, with considerable shortening and narrowing. The concentration of hemoglobin was 47 per cent; erythrocytes numbered 4,170,000 and leukocytes 11,900 in each cubic millimeter of blood. The Wassermann reaction of the blood was negative. For seventy-two days the patient received the usual antibody globulin solution to the extent of his toleration. He was given most careful attention, and such adjuncts as blood transfusion, special diets, small amounts of vaccine, and preparations of iron compounds availed nothing in the way of improvement. At the end of this period of treatment this patient's skin tests were positive to the same degree as at the beginning.

The fact that in Case 9 (table) there originally was a negative skin reaction, and that the patient went home in good condition only to return seventy-nine days later, in trouble from ulcerative colitis, and with skin tests positive, allows an interesting speculation. If this patient makes progress clinically, we would expect the intracutaneous tests to become negative a second time. The controls demonstrated only that the average person gives a definitely positive skin reaction to the antigens.

SUMMARY AND CONCLUSIONS

We have studied the skin reactions of fifty-six patients with chronic ulcerative colitis after intradermal injections of antigens prepared from cultures of organisms isolated from the rectal mucosa of patients with the disease. The skin reactions of ten normal adults, using the same antigens, have been observed. As the condition of patients who had given positive skin tests improved, their skin tests became negative or decreased in intensity of reaction. This survey establishes the antibody globulin solution more strongly as a specific therapeutic agent in chronic ulcerative colitis. Employment of similar antigens for skin tests may give valuable aid in carrying on the treatment of patients with chronic ulcerative colitis.

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OBSTRUCTIVE JAUNDICE FROM A SURGICAL STANDPOINT*

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IN discussion of the treatment of patients with obstructive jaundice, of outstanding importance are the following points: The differential diagnosis between lesions within the liver and those without; the determination of the propitious time for operation; the correlation between the patient's symptoms and operative findings; the estimation of satisfactory postoperative progress, and finally the recognition of certain procedures of value in the treatment of postoperative complications.

DIFFERENTIAL DIAGNOSIS

From the standpoint of differential diagnosis, biliary colic followed by jaundice, with or without associated chills and fever, is indicative of intermittent obstruction to the passage of bile from the liver to the intestines. This is true whether the cause of the obstruction is stone in the common or hepatic ducts, tumor in the head of the pancreas, or stricture. When the jaundice is painless, the possibility of the lesion being intrahepatic must be considered. The distinction between intrahepatic obstruction and obstruction due to a tumor in the head of the pancreas in some cases is difficult. Broadly speaking, the appearance of jaundice without pain, affecting a patient whose stools contain bile, or from whom bile is obtained by duodenal tube, and whose gallbladder is not palpable or distended, is most likely to be the result of an intrahepatic lesion. Should the jaundice be constant and bile absent from duodenal content or stools, regardless of whether a distended gallbladder can be felt through the abdominal wall, the lesion is likely to be pancreatic.

In a study of patients operated on at the clinic for carcinoma of the head of the pancreas, producing obstructive jaundice, it was discovered that a distended gallbladder was palpated through the abdominal wall in only half of the cases. In a small group (approximately 5 per cent) a stone may exist in the common or hepatic bile duct, without causing pain. The corollary of this is that when the condition of the patient is such that abdominal exploration can be carried on with reasonable safety, the patient should be given the benefit of such a procedure. No one is infallible in the differential diagnosis of obstructive jaundice. The diagnosis is always so difficult, and the chance of saving a life so important, that, however positive the evidence of malignancy, operation is advised in all cases when the general condition permits.

PROPITIOUS TIME FOR OPERATION

In determining the propitious time for operation, an attempt should be made, in the preoperative diagnosis, to determine the situation of the lesion, for if the history is one of intermittent obstruction in which pain has played an important part, there is the possibility that the jaundice will decrease, making the patient a better operative risk.

The patient whose blood requires longer than nine minutes to coagulate constitutes an increased operative risk that is due not only to the tendency to bleed, but also to the probably more than usual injury to the hepatic cells. I have been of the opinion for some time that the relation of hepatic injury to an abnormally elevated coagulation time was a significant feature in jaundiced patients. In most instances, intravenous injection of such a hemostatic substance as calcium chloride, or of glucose, or transfusion of blood, suffices to lower a prolonged coagulation time to within normal limits, even though, in some cases, such reduction is sustained for a period of only a few hours. Should this be the case, one should govern the interval between the transfusion and the operation accordingly.

With the history of painless jaundice, and an abnormally prolonged coagulation time, one is more hesitant about carrying out an operative procedure than if, from the history, one would be led to believe that the obstruction was the result of stone. In such cases a period of delay, even though it necessitates allowing the patient to return home, will often suffice to clarify the diagnosis and present exact indications for exploration.

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*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Inter-State Postgraduate Medical Association of North America, at Milwaukee, October 21, 1931.

Of jaundiced patients, renal function always should be determined, for not infrequently it is abnormally decreased. Preoperative study of the blood urea of a patient who was recently operated on revealed accumulation of 150 mg. in each 100 c.c. The value for urea decreased rapidly, with improvement in renal function, under eliminative procedures such as intravenous injections of hypertonic solutions of glucose, drastic catharsis, and hot packs, to the extent that successful cholecystectomy, with removal of stones, and choledochostomy were carried out, in spite of the fact that the patient was seventy-five years of age.

It is worth while dwelling on the influence of age as a factor in operative mortality. On other occasions, I have emphasized the fact that it is the patient's general condition and not his age which is one of the determining factors in operative mortality, substantiating this argument by presentation of several patients between the ages of sixty-nine and eighty years, on whom I have successfully performed extensive gastric resection for carcinoma. A similar ability of elderly patients to withstand operations on the gallbladder and common bile duct, even when accompanied by jaundice, is apparent. Certainly when male patients aged from seventy-five to eighty-five years, in satisfactory condition, are able to withstand prostatectomy, it would seem that there would be no reason why an intra-abdominal operation should be looked on with any greater hesitation.

The presence of purpuric spots on the skin of jaundiced patients has been regarded by some as a danger signal, which should not be passed without pause. Although I am not able at present to present the exact statistics, I am rather of the opinion that their presence as indications of greatly increased operative risk has been overemphasized. Their presence often has been noted in jaundiced patients whose coagulation time has been within normal limits, and whose postoperative course has been uneventful. I do not recall a single patient with such purpuric spots who has been denied operation, unless, for other reasons, operation was obviously unwise at the time it was considered.

THE SIGNIFICANT FEATURES IN THE OPERATIVE FINDINGS ADEQUATELY EXPLAINING THE TYPE OF BILIARY OBSTRUCTION

Satisfactory results in surgical treatment of jaundiced patients depend on adequate and complete relief of the obstruction. For purposes of this discussion, the obstructions can be limited to stones in the common and hepatic bile ducts, strictures, tumors of the pancreas and of the ampulla of Vater, and finally the obstruction seen in that group of cases of subacute cholecystitis in which the jaundice is apparently the result of associated cholangeitis and pancreatitis.

The appearance of the gallbladder and the common bile duct.—When the obstruction is inflammatory in origin, whether secondary to stones or stricture, the walls of the gallbladder are thickened and its color usually is changed from the normal bluish-green to a cream. When the obstruction of the common bile duct is pancreatic in type, the color of neither the gallbladder nor of the common bile duct is changed, unless there is an associated infection, with cholelithiasis, which occurs but rarely. With the wall of the gallbladder showing signs of inflammation, with stones absent as far as palpation reveals, and with jaundice present, the probabilities are that a stone is present in the common or the hepatic duct. Such stones denote their presence by thickening and change in color of the walls of the common bile duct and increase in its caliber. Many stones in the common duct can be palpated, but stones in the ampulla are frequently overlooked unless the duct is opened and carefully explored with probe and scoop. Even then, the scoop or probe may slip by a small stone nestling in the ampulla, and it is always advisable to palpate the duct with scoop or probe in it, which makes a small stone more prominent. Wherever the size of the duct permits, it is of value to use the little finger as a probe, inserting it in both directions of the duct, to make sure that a stone is not being overlooked. When stones have been removed from the common or hepatic duct, it is my custom to see to it that a probe or scoop of large size can be passed through the lower end of the ampulla into the duodenum, thus being certain that obstruction has been relieved, and at the same time accomplishing sufficient dilatation of the ampulla so that a stone, smaller in diameter than that of the scoop, can pass spontaneously into the duodenum.

When the gallbladder shows evidence of subacute inflammation and a mild degree of jaundice is present, when the common bile duct is normal in size and no stones are apparent to the one who is exploring with the scoop, the probabilities are that the associated cholangeitis and pancreatitis have been the causes of the mild degree of jaundice. Such explanation, however, should be accepted only after the most thorough and painstaking search of the tract for stones. Failure of jaundiced patients to recover when stones of the common and hepatic ducts have been present, is, in most instances, due to the fact that stones in the duct have been overlooked and have later dropped down, to produce an obstruction which is increased to the extent that hepatic and renal insufficiency occur.

Tumors of the head of the pancreas.—The head of the pancreas, as well as its body, should be palpated as a part of the examination of the biliary passages. With a mass in the head of the pancreas, and distention and normal color of the common bile duct and gallbladder, the obstruction is most surely one of the pancreatic portion of the common bile duct. In approximately 33 per cent of cases the lower end of the common bile duct passed posterior to the pancreas rather than through it, and in this minor group of cases, a tumor in the head of the pancreas does not produce jaundice until late. With a tumor in the head of the pancreas, the differential diagnosis of a malignant lesion and a benign one can be accurately made only by removal of a specimen for microscopic diagnosis. This usually is inadvisable because of the risk of such procedures, and because of the fact that a surgical procedure, in either instance, should be directed to relief of the obstruction and not to attack on the lesion itself. Study of the progress of patients following relief of obstructions due to tumors in the head of the pancreas indicates that approximately 15 per cent of the obstructions were the result of inflammatory changes. This should strike an optimistic note in a discussion of the lesion with the patient or his relatives. If the lesion is inflammatory, relief of the obstruction is followed by lasting good results. Even though the lesion is malignant, jaundice and itching are relieved by anastomosis of the biliary channels and the intestine, and the patient is able to enjoy months and frequently years of comfort. The malignant tumor in the head of the pancreas grows slowly, but in its later stages may produce sufficient deformity of the duodenum to interfere with the passage of gastric and duodenal content. In such cases, provided the patient's condition permits, gastrojejunostomy as a palliative procedure will still further prolong his life.

Condition of the duodenum.—The possibility of a large, perforating ulcer on the posterior wall of the duodenum, penetrating the pancreas and producing obstruction of the common bile duct by extension of the inflammation to surrounding structures should be remembered as a possible cause of biliary obstruction. Such a lesion is likely to be overlooked, due to its low position in the duodenum and the difficulty of its visualization in roentgenologic examination. This is particularly true if the patient has been operated on previously for disease of the gallbladder. A history of intermittent pain in the right upper quadrant of the abdomen, and the finding of a normal appearing common bile duct should immediately call attention to the possibility of such a duodenal lesion.

Tumors of the ampulla of Vater.—Such tumors, although they occur relatively infrequently, produce in general a painless type of jaundice, or, if the lesion becomes ulcerating, may be the source of severe intestinal hemorrhage. Since it is a relatively rare condition, it is more likely to be overlooked. In a recent case in which I successfully resected the ampulla and the posterior wall of the duodenum, with simultaneous anastomosis of the common bile duct to the duodenum, the carcinomatous lesion was small and of low degree of malignancy (adenocarcinoma graded 2). The small size of these lesions, their low degree of malignancy, their tendency to produce biliary obstruction with jaundice early and metastasis late, make early diagnosis and localization of the lesion important, and its surgical removal valuable.

MEASURES DIRECTED TOWARD RELIEF OF THE OBSTRUCTION

Following removal of stones from the common bile duct, the opening of the duct is sewed around a catheter, and this is left in place for approximately twelve days. The reason for this is that there is a probability that subsequent to the manipulation of the interior of the duct with a scoop sufficient edema or hemorrhage might produce temporary obstruction, and interfere with the patient's recovery. The catheter, therefore, serves as a safety valve. When there is associated hepatitis and pancreatitis, particularly in that group of cases in which the jaundice has not been accompanied by stone in the common or hepatic duct, prolonged drainage of the duct, for six to eight weeks or longer, is advisable. Such being the case, drainage is better accomplished by means of a small T-tube than by a catheter. A rubber tube or catheter should never be placed completely within the duct without its distal portion projecting through the papilla of Vater into the duodenum. With such projection through the papilla of Vater into the duodenum, intestinal peristalsis usually will pull the catheter completely into the lumen of the intestine, from whence it is spontaneously evacuated with the movement of the bowels. On the other hand, the ampulla or papilla of Vater would serve as a too effective barrier to passage of a piece of tube placed entirely within the duct. On one occasion, I removed such a tube, which a surgeon in another city had inserted into the duct two years previously; it was encrusted with bile salts.

Strictures.—When sufficient normal duct remains above the stricture to make possible accurate anastomosis of the remaining portion of an opening made in the duodenum, permanently good results can be expected, unless there is associated cholangeitis or hepatitis. In a group of patients whom I operated on for stricture of the common or hepatic bile duct, in thirteen of whom sufficient duct remained above the stricture into the duodenum to enable it to be anastomosed accurately to an opening in the duodenum, eight patients have had no further evidence of disease of the biliary tract, neither colic, jaundice, nor chills and fever. In several of these cases, more than four years have elapsed since operation. When the stricture is at the juncture of the common and hepatic ducts, and insufficient duct remains for accurate anastomosis to the duodenum, occasional good results are obtained by excision of the stricture, with direct anastomosis of the ends of the duct. It must be ascertained, of course, that the distal portion of the duct is patent. Although this type of operation for stricture has not been in particular favor, due probably to the fact that, associated with the stricture, sufficient infection remained in the duct so that partial contracture of the anastomosis probably occurred, with recurrence of symptoms of incomplete obstruction, mild, however, in degree. When the stricture is complete, and involves the common and hepatic ducts, establishment of an external biliary fistula, which later can be coned out and transplanted into the duodenum, has given very satisfactory results. Last year, I reported five such cases in which I had operated, in three of which excellent results had been obtained.

If a patient presents himself with an external biliary fistula, having been operated on elsewhere, before considering transplantation of the fistula the condition of the common and hepatic ducts and gallbladder must be ascertained. For example, if an egg-white material is excreted, the probabilities are that the gallbladder remains and that there is a stone in the cystic duct. When bile is excreted, the probabilities are that the obstruction is in the common bile duct, and that it is due either to stone, stricture, or tumor of the pancreas. If transplantation of an external biliary fistula is deemed the procedure of choice, it must adequately drain the intrahepatic ducts, and the latter must be free from stones; otherwise, the obstruction will recur. Furthermore, the possibility of a more certainly curative type of operative procedure, namely, hepaticoduodenostomy, should be considered if sufficient normal duct remains above the stricture or the fistula to enable the duct to be accurately anastomosed to the duodenum.

When a tumor in the head of the pancreas is the cause of the biliary obstruction, cholecystenterostomy relieves the jaundice and prolongs the patient's life, in a satisfactory manner, for from fourteen to forty-eight months. When the condition of the patient is such that the operation can be carried out as a primary procedure, in one stage, such is the preferable procedure. On the other hand, if patients are in unsatisfactory general condition, there is a field for the operation in two stages in which biliary drainage by cholecystostomy is first established, with improvement in the function of the liver and kidneys and in the patient's general condition. Ten or twelve days later, the second stage of the operation can be carried out, at which time the gallbladder can be anastomosed to the stomach or duodenum. These methods were used last year at the clinic in ten cases of cholecystenterostomy for tumors in the head of the pancreas with obstructive jaundice, with recovery in nine. An equal number of patients were operated on the previous year with similar results. It should not be forgotten that in a consideration of cholecystenterostomy as a procedure of value, in pancreatic obstruction of the common duct, the patient, in addition, has received the benefit of exploration of the biliary passages, eliminating the possibility of a so-called silent stone of the common duct.

INDICATIONS OF SATISFACTORY POSTOPERATIVE PROGRESS

The most certain indication of satisfactory progress subsequent to operation is the general appearance of the patient, his feeling of well-being, a normal output of bile and of urine of normal color, and temperature and pulse rate within normal limits. From 150 to 400 c.c. of bile of normal color excreted in each period of twenty-four hours, is satisfactory evidence that hepatic function is normal. Should blood appear in the bile, one must be alert to prevent it from clotting in the tube or in the duct, producing secondary obstruction. If, in association with bleeding from the wound, there is blood in the bile, the situation should be regarded as of considerable seriousness, and transfusion of blood given immediately and again as often as necessary. Should the bleeding continue, one should unhesitatingly open the incision, carry out exploration of the operative field to determine the site of the bleeding if possible, and control it. In a recent case, following removal of stones from the common bile duct and the gallbladder, secondary hemorrhage occurred, necessitating reopening of the incision on two occasions. On the former occasion, the operation was done in the patient's room and on the latter, in the operating room; the second time, it seemed likely that the patient might expire while the exploration was being carried out. The point of origin of the bleeding was identified, and the bleeding controlled; the blood clots which had accumulated above the liver, depressing and twisting it, interfering thereby with the circulation in the inferior vena cava, were evacuated and the patient recovered. Similar depression of the liver occurred four years ago in a case in which operation had been performed for stricture of the common bile duct; the depression occurred from leakage of bile. After the incision had been opened in the patient's room on the night of the operation, bile gushed from above the liver. This discharge was followed by a fairly rapid decrease in pulse rate from 160 to within normal limits. The respiratory rate decreased from 36 to normal, and the patient made a satisfactory recovery.

Studies of renal function, of the degree of jaundice, and of the coagulability of the blood should be carried out subsequent to operation. With the decrease in the amount of bile in the blood, there is no question that the obstruction has been adequately relieved. Should the coagulation time be increased, measures directed to its decrease should be considered. An intake of fluid of 2,500 to 3,000 c.c. daily should be insisted on. A portion of this fluid can be taken satisfactorily by proctoclysis in the first few days of convalescence, when the patient is unable to tolerate any considerable quantity of fluid by mouth. The use of physiologic solution of sodium chloride given subcutaneously or intravevenously twice daily in a quantity of 1,000 c.c. use of a 10 per cent solution of glucose in physiologic solution of sodium chloride, given intravenously twice daily in a quantity of 1,000 c.c. at each administration. If the amount of bile drained is scant, but the jaundice stationary, use of one of the cholagogues may stimulate the liver sufficiently to cause it to excrete a greater amount of fluid, and finally, should the condition of the patient be such that one is uncertain as to whether bleeding is occurring or the drainage tube is obstructed, or if the obstruction is inadequately relieved and the patient's chance of recovery seems seriously handicapped, exploration of the operative site should be undertaken with the least possible delay.

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PRESIDENT'S LETTER

THE medical profession of today faces many important problems that a comparatively few years ago appeared on the horizon merely as faint clouds. There is evidence that our national and state organizations are alive to the need; first, of study of these problems in a fair-minded way and, second, based on that study of concerted action in giving advice as to how these problems may best be solved to the advantage of the public and of the profession. If the medical profession does not give heed to these problems, enthusiastic laymen will have enacted into laws their ideas of a solution which may in reality be positively harmful. The average busy practitioner cannot be expected to devote time to such problems, but it should be recognized that there are available certain of our members who are qualified by knowledge and adaptability to consider and discuss them. These members may or may not be leaders in scientific medicine, but they are nevertheless justly worthy of such recognition because of their knowledge of medical economics. It is unfortunate that men of this type, who are known to be public spirited and unselfish, are often spoken of scornfully as being medical politicians. In the next breath the same critic may enthusiastically insist on the organization and protection of the rights of the profession! Occasionally one hears complaints about the cost of maintaining our state organization. In my opinion the annual dues to our state association directly and indirectly give more in return to members than any like amount that is spent. Since our state organization has become more closely united and since we have had a salaried medical secretary, the Basic Science Act has been passed in our state, the Statute of Limitations has been reduced to two years, and the Medical Practice Act, which protects the people against quacks, cultists, and so forth has been established. The members of our legislative committee are not infallible; they are treading uncharted paths and the going is often hard. There is much yet to be done, and it is even more important to see that what has already been done is not nullified. Constant watchfulness over legislative activities is essential.

Industrial insurance cases comprise an increasing part of the work of the profession of our state. There has been, and still is, disagreement between the profession and insurance companies. This is not as serious as it appears. If insurance companies had the sole right irrespective of conditions to designate the medical attendant, and the patient or the insured person had no right or voice in the selection, the situation would be capable of abuse. If, on the other hand, the patient had the sole right to select his own medical attendant and the insurance company had no right or voice in the matter, the situation would be equally bad. There must be an intermediary position, satisfactory to all parties, so that the rights of the individual will be fairly protected and no unnecessary hardships endured.

The Minnesota State Medical Association has not only been alive to its own problems but it has been largely responsible for the present activity of the American Medical Association in showing that the plan of the Veterans' Administration, to increase the number of hospital beds, is vicious, and provides needless duplication of hospital space. There is a large number of beds available in civilian hospitals all over the country. On the committee appointed conjointly by the American Medical Association, the American Legion and the Veterans' Administration are Dr. Ben Wright, Dr. E. A. Meyerding, Mr. E. B. Cliff, Mr. Paul Fessler, and Mr. A. M. Calvin, all from Minnesota. The rapidity with which the Minnesota plan is being adopted throughout the country by other state associations is exemplified by the general raising of annual dues, and by the employment of full-time secretaries both in the state, and in larger, local medical organizations.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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THE STATE MEETING

There is no indication of "repression" in the program of the coming State Medical Meeting which appears in this number of the Journal.

The two and a half days of presentation of scientific material have been divided for the most part between the medical and surgical sections with joint sessions for such subjects of widespread interest as transurethral prostatectomy, malignancy, and the numerous demonstrations listed. Movie fans will be able to observe the application of the cinema in medical instruction.

There is no subject more alive in our present economic crisis than that of the hospital care of veterans. The subject is one of fundamental economic importance to the hospitals, medical profession, and taxpayers. That the present method of furnishing hospital care for veterans and the proposed expansion of hospital facilities is an extravagant and unsatisfactory way to furnish this service is the contention of our profession. This subject will dominate the Economics meeting this year.

It has been said that there is nothing new under the sun. This year's program contradicts such a contention. Those who attend the meeting will find much mental stimulation.

ROCKY MOUNTAIN SPOTTED FEVER IN MINNESOTA

A case of Rocky Mountain spotted fever[1] reported recently from Minneapolis focuses the attention of Minnesota physicians on the possibility of this disease being endemic in the State.

In 1915 George Douglas Head[2] of Minneapolis reported a case of typhus fever which occurred in Minneapolis. Whether this case was one of Rocky Mountain spotted fever or typhus is impossible to say. Clinically these two diseases are almost impossible of differentiation. At that time laboratory methods were not sufficiently developed to make the distinction. Kemp and Grigsby[3] have reported a case of Rocky Mountain spotted fever in the vicinity of Dallas, Texas. Badger, Dyer and Rumreich[4, 5] have described cases of Rocky Mountain spotted fever occurring in Virginia and have noted variations in the animals inoculated with virus obtained from Montana as compared with animals inoculated with the virus obtained from the East. There was less virulence associated with Eastern virus. They have suggested calling the two types Eastern and Western, respectively. It is to be noted that the strain isolated in Minnesota differs in its reaction in guinea pigs from the Eastern and from the Western strain, but immunizes against either strain.

Badger, Dyer and Rumreich also were able to show that the dog tick (*Dermacentor variabilis*), distributed throughout the Eastern areas where Rocky Mountain spotted fever has been found, is able to transmit the disease. *Dermacentor andersoni* (also called *Dermacentor modestus*), the transmitter of the moutain strain, is strictly limited to the intermountain area between the Cascades and Rockies from the northern border of the United States as far south as Southern Nevada and Utah. Maver[6] had previously reported *Dermacentor variabilis* as a carrier and also showed *Dermacentor marginatus* and *Amblyom-*

ma Americanus as possible transmitters. *Dermacentor occidentalis* has been shown to transmit the disease on the West Coast (California).

Toomey[7] describes the Eastern area of distribution for the Eastern type of Rocky Mountain spotted fever from the southern border of New York to the northern border of Florida and from the Atlantic coast line to the Appalachian mountains. If this is correct, what of the cases reported in North and South Dakota and Nebraska and of our own case in Minnesota? Toomey limits the original Rocky Mountain spotted fever to the distribution of *Dermacentor andersoni.* The finding of this disease in states east of the Rockies extending to the Atlantic seaboard raises the question, has the disease always been endemic in regions east of the Rockies or has there been a migration of the disease from the epidemic area due to some ecological imbalance? Along this line one can assume that the reservoirs (rodents) certainly have been disturbed by cultivation, deforestation, railroads, automobiles, etc.

There are three ticks common in Minnesota: the dog tick (*Dermacentor variabilis*), the rabbit tick (*Hemaphysalis leporis palustris*), and the bird tick (*Hemaphysalis cinnabarina*). Of these the dog tick is the transmitter in this State because it is the only one which feeds on man.

Dr. Parker states that: "Nearly ten thousand ticks have been tested at the U. S. Public Health Service Laboratory at Hamilton, Montana, in coöperation with Dr. R. G. Green of the University of Minnesota Medical School, and in excess of one per cent of the American dog tick, *Dermacentor variabilis,* and two per cent of the rabbit tick, *Hemaphysalis leporis palustris,* have provoked reactions in laboratory animals which, had the ticks been collected in a known endemic area, would be considered definite evidence that the ticks concerned were carrying a low grade Rocky Mountain spotted fever virus."

During the coming months it would be well for physicians of this State to be on the watch for obscure fevers with rashes as possible cases of spotted fever. The blood of all suspects should be sent in to the State Board of Health for the Weil-Felix reaction. The Weil-Felix reaction is common to both typhus and Rocky Mountain spotted fever. Dr. H. A. Reimann, of the Department of Medicine of the University of Minnesota, will be glad to check all positive cases by cross immunological test on animals. In this manner the prevalence of spotted fever and its characteristics in Minnesota will be realized.

H. L. U.

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IMMUNITY AND HYPERSENSITIVITY

We must remain so alert to the general trend of opinion based upon investigation in such a bewildering variety of fields that all too often we, as general readers, give up. So-called practical minds decry what they term theoretical hair splitting to the point that far too much time elapses between the announcement of victorious research and its therapeutic application by physicians. It is likely that insulin has come into use all too slowly and years will elapse before the present hematopoietic stimulants are used with even the decisiveness presently known and proven.

A recent excellent review of staphylococcus infection in a report* of the "General Staff Conference of the University Hospitals" has much of interest in terms of this ubiquitous invader and those aware of its possibilities need not be told to approach boils and carbuncles with circumspection. However, I wish particularly to draw attention to the thought expressed in the report which is crystallizing about Clawson's teaching that there is a profound difference in the animal reaction to intramuscular and intravenous injections of killed bacteria (vaccine). The latter seems to decrease sensitivity, the former to promote it. Sensitivity and immunity or healing do not appear to proceed coördinately. A supersensitive host appears to predispose to exudative reactions, confronting the presence in the tissues of the autogenic source. With staphylococci it is a series of abscesses among which kidney and bone foci stand out conspicuously. In tuberculosis localized nidi (such as, for example, caseating glands), with tissue supersensitivity lay the foundation for allergic subclavicular extensive exudative Assmann-Redeker reactions. In subacute bacterial endocarditis the blood stream is actually fed live virulent organisms. The titer for their agglutination may rise enormously high. Wherever these embolic masses lodge there is little exudation and never abscesses.

The work of Petroff, Florence Sabin, and others, experimentally, injecting the fraction products of tubercle bacilli into animals, appears to prove that the sensitivity and allergy are promoted by the protein fraction, and immunity by the lipoid portion. Such studies may ultimately straighten out the devious tangle of BCG and establish less mooted tuberculosis prevention. In the meantime less gifted and endowed humble practitioners may well hesitate in the use of general and specific vaccines, at least in boils and "rheumatism," and leave to further investigation the answer to the possible use of intravenous vaccines where desensitization appears of therapeutic benefit.

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*By Assistant Professor Wm. A. O'Brien.

E. L. T.

THE MEDICAL CARE OF VETERANS

The apparent present status in Minnesota

We hope you all have read the page on medical care of veterans in the April number of Minnesota Medicine. The committee of the Ramsey County Society has continued its good work; we understand that several Ramsey County Legion Posts have taken an interest in the problem. In Hennepin County a committee has been at work since January. The doctors are well informed and several Posts have expressed their interest. The District Dental Society is becoming actively interested also. We hear that the problem is receiving careful attention on the part of medical societies and Legion Posts throughout the state.

Resolutions in support of several different plans for the care of veterans have been passed, some of them on insufficient information, and, insofar as I can see, with very little prospect of support from the Legion of the State or from the medical profession as a whole.

At the recent spring conference of the Minnesota Department of the Legion there were many frank informal discussions between interested physicians in and out of the Legion and the leaders of the Minnesota Legion's rehabilitation work. Coöperation between the Legion and the medical profession is essential in solving the problem. In this state it should be relatively easy to establish a basis for coöperation.

While I cannot at this time speak for the Committee on State Health Relations, it seems to me that it may be helpful to give some statement of the problem as I see it in order to reduce the points of argument to a minimum. Fortunately in Minnesota the Legion has studied the problem intelligently and has been leading the national Legion in that matter.

We seem to be agreed on the present accepted practice that disabilities of service origin as well as tuberculosis and nervous and mental diseases, because of presumptive service connection, should be cared for in veterans' hospitals. It must be remembered in this connection also that the Veterans Bureau provides that, in case of emergency, service-connected disabilities may be hospitalized in their home communities at government expense.

The Minnesota department of the Legion last year proposed that the right to be hospitalized in his home community at government expense be extended to the veteran suffering from a non-service-connected ailment in case of emergency. It seems to me that we should have no hesitation in doing all we can for the adoption of such a plan.

The care of medical and surgical non-service-connected disabilities not constituting emergencies is still under discussion, and many of the questions raised are far from solution; doctors themselves do not seem to agree in some respects.

The Minnesota Legion leaders say that in their experience in this State they have made satisfactory progress only when they have attacked the veterans' problems one step at a time. They insist that their proposal for emergency care of veterans in their home communities must be proven effective in practice before they will endorse any extension of the principle to non-emergency cases.

It seems to me that there is much to say in favor of that idea. Emergency cases are the ones most in need of prompt care close to home. Adoption of such a plan will destroy the strongest arguments used in favor of the construction of additional veterans' hospitals. If it can be proved that veterans can receive as good care or better in their home community hospitals by doctors of their own choice in cases of emergency, it will be easier for the Legion and others to believe that such care would be good in other cases.

The above ideas are not given officially, but rather to stimulate thought and discussion. If you have other ideas please let the Committee on State Health Relations hear from you at once. We hope that the State Medical Association and the Minnesota Department of the American Legion through continued coöperation can work together toward some satisfactory solution of the entire problem of the medical care of veterans.

T. H. Sweetser.

COÖPERATIVE CLINIC TOURS

Perhaps sufficient emphasis has not been given in our columns to the foreign clinic tours which have been arranged by the various State Medical Journals with the Amerop Travel Service for this summer. Notice has just been received that reductions in rates by the steamship companies have resulted in a lowering of the figures for the clinic tours stated in our last issue of the Journal. First class accommodations have been reduced

$150 and tourist $47.50, which makes the clinic tours this summer more attractive than ever. It will be noted that all three tours provide for attendance at the Centennial Anniversary meeting of the British Medical Association, a further special attraction this year. Clinics are being arranged in the principal cities of Europe, London, Paris, Vienna, and Berlin. Choice of the steamers Bremen and Europa of the North German Lloyd Line leaves nothing further to be desired in the way of accommodations.

The State Journals have no hesitation in recommending these Clinic Tours to Association members and believe the trips will offer valuable clinical opportunities combined with a vacation trip abroad. Further details may be obtained upon inquiry at the office of MINNESOTA MEDICINE or by writing direct to Amerop Travel Service, 132 North LaSalle Street, Chicago.

OF GENERAL INTEREST

Dr. Rollin E. Cutts, formerly of the Mayo Clinic, Rochester, Minnesota, is now associated with the Vicksburg Clinic, Vicksburg, Tennessee.

Dr. H. J. Fortin, formerly of the Mayo Clinic, Rochester, Minnesota, has opened offices at 802 Black Building, Fargo, North Dakota.

Dr. H. C. Thornton is now on the staff of the Indianapolis City Hospital, Indianapolis, Indiana. He was formerly associated with the Mayo Clinic, Rochester, Minnesota.

Dr. V. S. Cabot has been elected chief of staff at St. Barnabas Hospital, Minneapolis, with Dr. Joseph Hedding, vice president, and Dr. W. B. Holt, secretary-treasurer.

Dr. J. F. McClendon, professor of Physiological Chemistry at the University of Minnesota, has arrived in Japan, where he will conduct research work in iodine and goiter as a visiting professor at Tohoku Imperial University.

The new infirmary building of the Walker Sanatorium, which was formally opened early in April, will accommodate eighty patients and has facilities for emergency operating rooms, staff consultation room and library, and clinical examination rooms.

Dr. F. C. Rodda, Minneapolis, was guest speaker at the last regular meeting of the Washington County Medical Society held March 8 at the Stillwater Club rooms. Dr. Rodda's subject was "Deficiency Diseases of Childhood."

Dr. Leonard G. Flannagan has become associated in practice with Drs. Leck and Morrow at Austin, Minnesota. Dr. Flannagan is a graduate of the University of Minnesota and has been affiliated with the Lakeside Hospital, Cleveland, Ohio. His specialty is the treatment of diseases of the eye, ear, nose and throat.

INTENSIVE EUROPEAN SUMMER COURSE

The eleventh intensive European summer course in Ophthalmology and Otolaryngology and the second in Surgery, Gynecology and Obstetrics under the direction of Dr. George W. Mackenzie, of Philadelphia, will be held in Vienna from July 8 to August 19 inclusive. The M. S. St. Louis sails June 25, which will allow for a few days in Berlin. Some fifty hours of lectures on ship-board are included in the course. For details address Dr. George W. Mackenzie, 1724 Spruce St., Philadelphia.

STATE BOARD OF MEDICAL EXAMINERS

NEGRO QUACK VIOLATES COURT ORDER AND LANDS IN COUNTY JAIL

State of Minnesota *vs.* Robert McGraw

Robert McGraw, negro quack of itinerant fame, has discovered, much to his sorrow, that he could not violate the terms of a suspended sentence given him last June by Judge Tifft, Glencoe, Minnesota, and get away with it. On June 12, 1931, McGraw entered pleas of guilty to two charges of practicing healing without a Basic Science Certificate before the Honorable C. M. Tifft, Judge of the District Court, and was fined $225.00 and costs on the first charge and given a suspended sentence of one year in the County Jail on the second charge. McGraw at that time expressed an ardent desire to return to his native State of Illinois. One of the conditions of the suspension of sentence required McGraw to refrain from the practice of healing in the State of Minnesota until properly licensed.

The State Board of Medical Examiners discovered that in the fall of 1931 McGraw came into Lyon County, Minnesota, and extracted the sum of $250.00 in cash to cure an alleged case of cancer. At that time McGraw was located in Sioux City, Iowa. About the first of March, 1932, McGraw moved back into Todd County, Minnesota, and located on a farm some four miles northeast of Bertha. Following an investigation of the Medical Board, Judge Tifft, on April 2, 1932, revoked the suspension of sentence and ordered McGraw committed to the McLeod County Jail to serve his one year sentence. On April 5, McGraw was arrested on the Henry Paschke farm in Todd County and returned to the McLeod County Jail, where he is now confined according to law. This is the first time since the enactment of the Basic Science Law in Minnesota that a quack has been ordered to serve the maximum sentence provided for a violation of the law.

SQUIBB ADEX TABLETS 10 D NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that it refused recognition to the name Adex Tablets 10 D for a cod liver oil concentrate fortified by addition of viosterol. The Council has repeatedly called attention to the fundamental importance of the rules designed to prevent the multiplication of names for the same product. This rule provides that the discoverer of a new product or of a new and sufficiently important therapeutic use for an old product may give it an arbitrary name. Squibb & Sons are not the first to prepare a cod liver oil concentrate nor does the addition of viosterol to a cod liver oil concentrate present a discovery. While Squibb & Sons deserve credit for the efforts which they have made toward increasing the potency and stability of cod liver oil concentrates, other firms have worked in the same direction. The Council decided that it could not recognize the name Squibb Adex Tablets 10 D because the application of a proprietary name to this product is not in the interest of the medical profession or the public and declared Squibb Adex Tablets 10 D unacceptable for New and Non-official Remedies. (Jour. A. M. A., March 19, 1932, p. 983:)

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

A patience and determination of almost Jovian proportions are needed by a medical profession that proposes to educate the public in modern methods of disease prevention. Such is the opinion of Dr. J. R. Neal of Springfield, Ill., president-elect of the Illinois State Medical Society, expressed recently before the Chicago Medical Round Toble.

To those medical economists who have been in the habit of dismissing public health education as a simple matter and less important, perhaps, than purely legislative activity, the following excerpts from Dr. Neal's paper may be of especial interest.

Dr. Neal regards the state of public knowledge of modern disease prevention as comparable to the state of mind of Indian savages when the savages were first introduced by the French to civilized government and a civilized religion. The Indians watched and listened, deeply impressed. But when the ceremonies were over and the voyageurs had departed they reverted to the Great Spirit and, incidentally, stole the metal arms of France from the cross for bullets for their new guns. Ultimately many of the Indians did adopt the white man's ways and some rose to high levels of civilization. These were the ones whose education began when they were children. But the progress was slow and it became noticeable only when it was possible to control the entire education of the children.

"Substitute the modern medical profession for the handful of French adventurers," says Dr. Neal; "let the public take the place of the Indians; and call scientific medicine the white man's laws and customs and we have, in 1931, an almost perfect reproduction of the scene enacted on the 14th of June, 1671, at Sault Ste. Marie.

"Scientific medicine, as we understand it today, is a very youthful development. Bacterial life and its relation to disease was discovered less than 100 years ago. Anesthesia has not yet celebrated its hundredth anniversary. The practice of faith healing, on the other hand, and of strange manipulations of the body, of invoking charms and of mixing the extracts of roots and herbs is as old as history itself. The idea that sickness originates from mysterious sources and that occult power, aided and abetted by incantations, is required to deal with it, harks back to the very earliest times.

"Entrenched as they are in the very marrow of the race these ancient traditions and superstitions will not be easily displaced. It is a difficult task even for the school to do the job, because the influence of parents frequently overbalances that of the teacher in such matters. . . .

"Some of the state medical societies have recently organized popular educational movements which are doing splendid, if limited, work. In Illinois, through speakers' bureaus and newspaper service and radio broadcasts, a very commendable educational work has been accomplished. Here, again, the magnitude of these efforts is diminutive in comparison with campaigns of education undertaken by the venders of nostrums and health foods. . . .

"Probably the most important and at the same time the educational results is the state normal colleges. Here the teachers who get hold of the children in the primary grades are trained. . . .

"The medical profession has recognized the importance of education. It has sometimes erred, however, in the method of enlightening the public. Most of its efforts have been expended along legislative lines. That way brings the quickest but, in many cases, the least return. It operates well among people who can choose wisely between the bona fide and the false and it is necessary as far as it goes. But more than one-half of our population has never been to high chool. For these, the influence of racial practice and belief is important. Traditions and customs as old as history are replaced in the public mind with the greatest difficulty. To do it one must begin with the child. Louis XIV could not sit upon his throne in Paris and transform by edict the customs and habits of a savage people 3,000 miles away."

OBITUARY

Dr. Eugene Hubbell

1855-1932

Dr. Eugene Hubbell, Saint Paul, died on April 20, 1932, following a short illness.

Dr. Hubbell was graduated from Hahnemann Medical College of Chicago in 1883, after which he practiced in Clearwater, Minn., for four years and later in Waseca for two years. He had been active in practice ever since he came to St. Paul forty-two years ago.

Dr. Hubbell was a member of the American Institute of Homeopathy, had served as president of the Minnesota Institute of Homeopathy and the Twin City Homeopathic Society. He had also been president of the American Association of Orificial Surgeons and the National Society of Physical Therapeutics. Dr. Hubbell was a member of the Allied Medical Association of America and the National Society of Medico-Physical Research.

Besides his widow, Dr. Hubbell is survived by three daughters, Mrs. R. A. Thuma of Saint Paul, Mrs. J. F. Gage of Atlanta, Ga., and Mrs. W. C. Scott of Chicago, and a son, Arthur C. Hubbell of Saint Paul.

Dr. W. J. Kremer

1878-1932

Dr. Walter J. Kremer, a member of the staff of St. Mary's hospital and consulting urologist of the United States Veterans' bureau, died Saturday, April 2, 1932, at the Veterans' hospital. He was fifty-three years old.

Dr. Kremer was born in Owatonna, Minn., April 25, 1878, and later moved to Cold Springs, Minn. After completion of a two years' academic course at St. John's University, he entered the University of Minnesota medical school, where he obtained his doctor's degree in 1911. After an eighteen-months' internship at the Minneapolis General hospital, Dr. Kremer began practice in Minneapolis.

During the World war he enlisted in the medical corps and was assigned to a base hospital at Camp Gordon, Ga., where he was commissioned a first lieutenant. After the war he resumed practice in Minneapolis.

He was a member of the American College of Surgeons, Minnesota State Medical Association, Hennepin County Medical Society, Minneapolis Clinical Club, the Urological Society of the Twin Cities and Nu Sigma Nu, medical fraternity. He was associate urologist at General Hospital, a former instructor in urology at the University of Minnesota, and formerly attending urologist at Park View Hospital.

Surviving are his mother and father, Mr. and Mrs. Ignatius Kremer of Cold Springs; two brothers, George of Fargo, N. D., and Charles of Cold Springs, and a sister, Clara, of Cold Springs.

Dr. John Vincent O'Connor

1867-1932

Dr. John Vincent O'Connor, Saint Paul, died at St. Joseph's Hospital on April 5, 1932, following a five weeks' illness.

Born in Minneapolis, September 1, 1867, of Irish parentage, he received his early education in the public schools in this state and in Ohio. After taking advanced musical instruction from Herman E. Zolk of Minneapolis, Dr. O'Connor became an accomplished pianist of unusual taste and ability. As a teacher of music he was enabled to pay his way through the medical course at the University of Minnesota, where he obtained his degree in 1895.

Dr. O'Connor practiced at Watkins, Minnesota, and later at Waverly, Minnesota, where he married Nellie Giblin, a native of Pennsylvania. After taking work at the New York Post-Graduate School and Hospital, he moved to Saint Paul in 1901, where he engaged in general practice until his final illness. He was one of the first tenants of the Lowry Building and joined the Ramsey County Medical Society, May 26, 1902.

Dr. O'Connor held the office of state examiner for the A. O. H. and was examiner for the Union Central Life Insurance Company. He was a member of the A. O. U. W., the M. W. A. and a charter member of the K. of C.

Dr. O'Connor is survived by his wife and five children, Gertrude H., Edna M., John G., Donald E., and Emmett J. O'Connor.

Dr. Lincoln E. Penny

1860-1932

Dr. Lincoln E. Penny, Saint Paul, died Monday, March 28, 1932, at the age of seventy-two, at St. Luke's Hospital after an illness of two days.

Dr. Penny was born in Arcadia, Wisconsin, in 1860. He graduated from Hahnemann Medical College in 1882 and Rush Medical College, Chicago, in 1885. After his graduation he moved to Saint Paul, where he practiced continuously until his death, a period of over forty years.

Dr. Penny served as a member of the staff of attending physicians at Ancker Hospital for thirty years.

Dr. Penny was a member of the American Institute of Homeopathy, and joined the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association in 1926.

In the passing of this beloved pioneer, an unexcelled example has been set to the younger generation by his honesty, professional courtesy and devotion to duty. Dr. Penny is survived by his widow, Mrs. Elsie Penny.

Dr. William Jesse Taylor

1844-1932

Dr. W. J. Taylor, pioneer physician in Minnesota, died at his home in Pipestone, Friday, April 15, 1932, at the age of eighty-eight.

William Jesse Taylor was born in Cataragus county, New York State, April 18, 1844. At the age of eight years accompanied his parents to Dane County, Wisconsin, and grew to manhood on a farm eight miles west of the city of Madison. He received his early education in the common schols of Dane County, later attending the University of Wisconsin and Rush Medical College.

He enlisted August 20, 1862, in Co. K., 32nd Wisconsin Volunteer Infantry, and served for nearly three years, being mustered out June 12, 1865. Following the war he returned to Wisconsin and completed his education.

He began practice of the medical profession at Black Earth, Wis., in 1873, but remained there only until May of the following year. In June, 1874, he made his first visit to Pipestone County, and at that time decided to make his future home there. While on this initial visit to the county, he participated in the first Republican county convention, attended by the only three men then in the county. Dr. Taylor was chosen to represent the county at the congressional convention at Owatonna later that year.

Dr. Taylor remained in the vicinity long enough to select his claim, as a soldier's homestead, and tree claim. He returned to Wisconsin and spent the winter of 1874-75 teaching in Dane County. In the spring of 1875 he again came to Pipestone County and built a house on his claim, remaining there until June. He returned to Wisconsin and remained there until March, 1876, when he came to Pipestone County to reside permanently, his wife joining him there later that year.

The crop on his farm being destroyed that summer by grasshoppers, Dr. Taylor went to Luverne to practice has profession, and spent most of his time there the next three years, his family meanwhile residing on his claim. In March, 1879, he returned from Luverne and arranged to practice in Pipestone. From that time he was for nearly fifty years active as a medical practitioner in this city and vicinity. At his office in Pipestone on June 7, 1888, the Southwestern Minnesota Medical Society was organized, and in 1901 Dr. Taylor was elected president of that society. He was at one time president of the Minnesota Public Health Association, and was a member of its board of directors at the time of his death, being re-elected last year. For some time he held the office of Surgeon in the Minnesota Department, G. A. R. He was for years a member of the Pension Examining Board for his district, and served as a member of the city and county health boards.

At different times Dr. Taylor had partners in the medical practice here, among these being Dr. Wm. McGillivray, Dr. George D. Rice and Dr. G. F. Schmidt. At a later time the Pipestone Clinic was organized with Dr. Taylor as a member, and during the last years of his practice he was associated, though not as a partner, with Dr. E. G. McKeown.

Dr. Taylor was active in civic and fraternal affairs and held numerous offices in these fields of endeavor.

Surviving are four children: Orville S. Taylor, St. Cloud, Minn.; Mrs. Luella McGillivray, Pipestone; Mrs. Oliver Bullard (Mayme), Spooner, Wis.; Mrs. Grant S. Beardsley (Maude), Eugene, Ore.; and Miss Jane Taylor, Everett, Wash.; also eight grandchildren, and one great grandchild. One brother, Orville J. Taylor, of San Diego, Calif., also survives.

Dr. Stephen O. Watkins

1851-1932

Dr. Stephen O. Watkins, eighty-one years old, died Monday, April 11, 1932, at the Masonic home in Bloomington, where he had lived for two and a half years.

Born at Amherst, N. H., Dr. Watkins practiced medicine in Minnesota for fifty years before his retirement in 1920. For several years he was physician for the Northern Pacific Railroad and lived at Carlton when it was called N. P. Junction. He was a charter member of Palestine Masonic lodge of Duluth.

Survivors are a daughter, Mrs. W. C. Carlson of Seattle; a son, S. Elmer Watkins of Phoenix, Ariz., and two sisters, Mrs. J. E. Green of Carlton, and Abby Watkins of Los Angeles.

A disease of the Rocky Mountain spotted fever type has been identified as occurring in States in the eastern and southeastern sections of the United States. During the course of field investigations of endemic typhus it became apparent that many of the cases observed differed materially in clinical aspects from endemic typhus as described by earlier investigators. It was noted that many of the patients suffered from a very severe disease which did not correspond to the clinical picture of endemic typhus and which resembled the spotted fever of the Rocky Mountains more closely than it did any other disease. Moreover, quite a high proportion of these cases gave a history of tick bite within a short time preceding onset. Laboratory studies confirmed the epidemiological findings. This eastern type of spotted fever has so far been found to exist in rural communities in Delaware, Pennsylvania, Maryland, the District of Columbia, Virginia, and North Carolina.—*Health News,* U. S. P. H. Service, March 29, 1932.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

PROGRAM 79TH ANNUAL MEETING MINNESOTA STATE MEDICAL ASSOCIATION, ST. PAUL AUDITORIUM

The Council will hold its first meeting at 6:30 p. m. Sunday, May 22, at the Lowry Hotel. It will meet again at noon, Monday, May 23, and at 2:30 Tuesday, May 24.

The House of Delegates will meet at 9 a. m. Monday, May 23, at the Auditorium, and for luncheon at noon Tuesday, May 24, at the Minnesota Club.

REFERENCE COMMITTEE

A. N. Collins	Duluth
C. B. Wright	Minneapolis
W. C. Carroll	St. Paul
O. E. Locken	Crookston
R. V. Williams	Rushford

SCIENTIFIC PROGRAM

Monday, May 23, 1932

SCIENTIFIC CINEMA

Exhibit Hall—1:00 to 4:30 P. M.

Selected scientific films will be shown all afternoon.

CLINICO-PATHOLOGICAL CONFERENCES

Surgical Hall—1 P. M.

Presiding Officer, Wm. A. O'Brien

Ancker Hospital Staff—J. F. Noble, Conductor, St. Paul

Mayo Clinic Staff—H. E. Robertson, Conductor, Rochester

St. Mary's Hospital Staff—E. L. Tuohy and G. L. Berdez, Conductors, Duluth

University Hospitals Staff—Wm. A. O'Brien, Conductor, Minneapolis

CLINICO-RADIOLOGICAL CONFERENCES

Surgical Hall

Mayo Clinic Staff—B. R. Kirklin, Conductor, Rochester

University Hospitals Staff—Leo Rigler, Conductor, Minneapolis

THE MINNESOTA RADIOLOGIC SOCIETY

Medical Hall

Radiological program at 2:00 P. M.

Monday Evening—May 23

Technical Exhibits (Open until 8:00 P. M.)

MEDICAL ECONOMICS MEETING

Auditorium Theatre—8 P. M.

Hospital and Medical Care of Veterans

Paul Fesler, President, American Hospital Association, *Chairman*

The Community Hospital—Edward A. Fitzpatrick, Dean, Marquette University, Milwaukee

The American Legion—E. V. Cliff, Ortonville

The Public—F. R. Bigelow, Saint Paul

The Doctor—Dr. Olin West, Chicago

Tuesday Morning, May 24

SECTION OF MEDICINE

8 A. M.

Presiding Officers—C. A. McKinlay, Minneapolis
A. M. Snell, Rochester

The Diagnosis and Treatment of Cardiac Arrhythmias—O. E. Locken, Crookston

Practical Aspects of Allergic Disease—F. W. Gaarde, Rochester

Symposium on Functional Disorders

Functional Gastro-Intestinal Disturbances — C. B. Wright, Minneapolis

Cardiac Neuroses—H. E. Richardson, St. Paul

Treatment of Affective Disorders—J. C. Michael, Minneapolis

The Element of Fear in the Development of Functional Disorders—A. D. Hoidale, Tracy

The Appeal of Quackery to the Neurotic Patient—W. C. Alvarez, Rochester

General Discussion—Opened by: E. L. Tuohy, Duluth

SECTION OF SURGERY

8 A. M.

Presiding Officers—George Earl, St. Paul
J. R. Manley, Duluth

Estimation of Disability in Industrial Cases—Edw. T. Evans, Minneapolis

Factors of Safety in Emergency Abdominal Surgery—V. S. Counseller, Rochester

Emergency Treatment of Eye Injuries—Hendrie W. Grant, St. Paul

Glandular Dysfunction as Related to the Sexual Hormone—George E. Hudson, Minneapolis

Intestinal Intussusception in Infants—J. M. Hayes, Minneapolis

Renal Factors in the Surgical Abdomen—Herman H. Jensen, Atwater

Hard of Hearing Problem—M. W. Wheeler, St. Paul

Fracture Work in the Smaller Community—B. J. Branton, Willmar

SCIENTIFIC CINEMA

8:20 A. M.

F. C. Schuldt, Chairman
F. H. Strom, Technical Adviser
D. A. Leonard, Projection Supervisor

Cancer Research—Lecturer: Wm. A. O'Brien, Minneapolis. Courtesy of the American Journal of Cancer

Repair of Second and Third Degree Lacerations of the Perineum and Rectocele—(Talkie.) Courtesy of Petrolagar Company

Delivery of Twins—Lecturer and Producer: J. J. Swendson, St. Paul

Cesarean Section—Lecturer and Producer: J. J. Swendson, St. Paul

Some Features of Hospital Administration—(Talkie.) Courtesy of Petrolagar Company

Anatomy of the Female Pelvis and Perineum—(Talkie.) Courtesy of Petrolagar Company

DEMONSTRATIONS

10 A. M.

The Physiologic Action of Animal Venoms—Hiram Essex, Rochester

Tuberculin Test—J. A. Myers, Lymanhurst School, Minneapolis

Blood Transfusion—H. E. Hullsiek, St. Paul

The Use of the Artificial Larynx—G. B. New and Charles Sheard, Rochester

Fresh Pathology—E. T. Bell, Minneapolis

Detection of Deafness (Group and Individual Tests)—M. W. Wheeler, St. Paul

Clinical Pathology—Including Congo Red Test for Amyloid, Friedman Hormone Pregnancy Test and Photoelectric Hemoglobinometer—A. H. Sanford and T. B. Magath, Rochester

Use of Ketogenic Diet in Urinary Infection. A Demonstration of the Effects of Diet on Bactericidal Power of Urine with Results in Treatment.
In children—H. F. Helmholz, Rochester
In adults—A. L. Clark, Rochester

Pathogenic Parasites in Man—Reed O. Christenson, Minneapolis

Phases of Bronchoscopy and Esophagoscopy of Importance in General Practice—Virgil J. Schwartz, Minneapolis

Diphtheria Immunization and Schick Test—B. F. Simon, St. Paul

Syphilis—Practical Points in the Therapy of—Paul A. O'Leary and L. A. Brunsting, Rochester

Trichomonas Vaginalis—Russell Moe, Duluth

Oleothorax—F. F. Callahan, Pokegama

Undulant Fever—Lucy Heathman, Minneapolis

Cholecystographic Technic—B. R. Kirklin, Rochester

Surgical Use of Maggots—Gordon MacRae, Duluth

Professional Pharmacy as Applied to the Physicians. Under the auspices of the Inter-Professional Relationships Committee of Hennepin County

GENERAL ASSEMBLY

11 A. M.

Fractures in and about the Neck of the Femur—W. C. Campbell, Memphis, Tenn.

Discussion—Emil Geist, Minneapolis; M. S. Henderson, Rochester

GENERAL ASSEMBLY

1 P. M.

Changing Attitudes towards the Malignancy Problem—Wm. A. O'Brien, Minneapolis

Discussion—W. J. Mayo, Rochester

SCIENTIFIC CINEMA

1 P. M.

Hemorrhoidectomy—An Anatomical Method—Lecturers and Producers: W. A. Fansler and J. K. Anderson, Minneapolis

Cancer of the Skin—Lecturer: Wm. A. O'Brien, Minneapolis. Courtesy of the American Journal of Cancer

Repair of Urethrocele, Cystocele, and Lacerations of the Cervix—(Talkie.) Courtesy of Petrolagar Company

Bone Tumors—Lecturer: Wm. A. O'Brien, Minneapolis. Courtesy of the American Journal of Cancer.

A Simplified Method of Filming Surgical Procedure Available to Everyone—Lecturer and Producer: L. A. Julin, *Rochester*

Surgical Technic of Nephrectomy, Pelviolithotomy, Ureterolithotomy and the Surgical Removal of Urethral Strictures—Lecturer and Producer: Waltman Walters, Rochester

The Tucking Operation for Strabismus—Lecturers and Producers—F. E. Burch and Hendrie Grant, St. Paul

Preliminary Hemostasis in Goiter Surgery—Lecturer Producer: Martin Nordland, Minneapolis

The Gillette State Hospital for Crippled Children—Lecturer: C. C. Chatterton, St. Paul

SECTION OF MEDICINE

2:30 P. M.

Treatment of Trichophytosis—L. A. Brunsting, Rochester

Recent Developments in the Treatment of Syphilis—H. E. Michelson, Minneapolis

The Use of Spinal Anesthesia in Gastric Crisis in Tabes—Gordon R. Kamman, St. Paul

Agranulocytosis—E. T. F. Richards and Kano Ikeda, St. Paul

Correlation between Clinical and X-ray Findings in Tuberculous Individuals—H. A. Burns, Ah-Gwah-Ching

Symposium on Pediatrics

Treatment of Epilepsy in Childhood—Irvine McQuarrie, Minneapolis

Present Status of Prevention and Treatment of Scarlet Fever—E. S. Platou, Minneapolis

Diagnosis and Treatment of Pyelitis—H. F. Helmholz, Rochester

Simplified Infant Feeding—O. W. Rowe, Duluth

Discussion—Opened by: W. R. Shannon, St. Paul; Thomas Myers, St. Paul
Globus Hystericus—Andrew Sinamark, Hibbing
Diagnosis of Laryngeal Disease—L. R. Boies, Minneapolis
Ocular Lesions of General Diseases—J. F. Brusegard, Red Wing
End-results Following Operations in Congenital Pyloric Stenosis—A. E. Sohmer and R. N. Andrews, Mankato
Some Clinical Aspects of Spinal Injuries—E. Mendelssohn Jones, St. Paul
Hyperparathyroidism—John de J. Pemberton, Rochester
Cervical and Abnormal First Thoracic Ribs—W. C. Carroll, St. Paul
Extra-uterine Pregnancy—Ivar Sivertsen, Minneapolis
Abscess of the Liver—A. N. Collins, Duluth
Surgical Treatment of Urogenital Tuberculosis—Gilbert J. Thomas, Minneapolis; Thos. J. Kinsella, Oak Terrace
Comparison of Duodenal Ulcer in Germany and the United States with Surgical Indications—Waltman Walters, Rochester; Walter Sebening, Frankfort-on-the-Main, Germany

ANNUAL BANQUET

Banquet Hall, Lowry Hotel
7 P. M.

Toastmaster—W. J. Mayo, Rochester
Address of Welcome—E. V. Goltz, President, Ramsey County Medical Society, St. Paul
The State Association—M. S. Henderson, President, Rochester, and the new President-elect.
The Women's Auxiliary—Mrs. Edward Schons, President-elect, Saint Paul
Your Medical School—Dean R. E. Scammon, University of Minnesota
Address—Reverend W. C. Sainsbury, Fargo, N. D.

Dancing

Open House—Ramsey County Medical Society Rooms, 15th Floor, Lowry Medical Arts Building

Wednesday Morning, May 25

SECTION OF MEDICINE

8 A. M.

Diverticula in the Gastro-Intestinal Tract—R. G. Allison, Minneapolis
Primary Carcinoma of the Lung—E. J. Simons, Swanville
Case Report on Epidemic Encephalitis—B. J. Cronwell, Austin
Sciatic Syndrome—W. P. Gardner, St. Paul
Recent Advances in Endocrinology—L. G. Rowntree, Rochester
Chronic Arthritis; Recent Studies on Etiology and Intravenous Vaccine Treatment:

1. Experimental Basis—B. J. Clawson, Minneapolis
2. Clinical Phases—Macnider Wetherby, Minneapolis
3. Discussion—Opened by: F. H. K. Schaaf, Minneapolis

SECTION OF SURGERY

8 A. M.

Important Points in Surgery of the Diseased Thyroid—Martin Nordland, Minneapolis
Anal Fistulæ—L. A. Buie, Rochester
Gradual Decompression of the Biliary System—John Culligan, St. Paul
Acute Intestinal Obstructions—W. G. Strobel, Duluth
The Noisy Ethmoids and Their Associates—W. L. Burnap, Fergus Falls
Sodium Amytal Anesthesia in Obstetrics—J. J. Swendson, St. Paul
Subdiaphragmatic and Liver Abscess—Walter G. Benjamin, Pipestone
Present-day Surgical Treatment of Carcinoma of the Rectum and Rectosigmoid—Fred W. Rankin, Rochester

SCIENTIFIC CINEMA—8:20 A. M.

Same Program as Tuesday Morning

DEMONSTRATIONS

10 A. M.

Retinal Vascular Changes—H. P. Wagener, Rochester
Spotted Fever and Tularemia—R. R. Parker, Hamilton, Montana, and R. G. Green, Minneapolis
Varicose Leg Ulcers—G. D. Brand, St. Paul
Chronic Ulcerative Colitis—J. A. Bargen, Rochester
Typing Pneumococci—H. A. Reimann, Minneapolis
Bronchiectasis and Lung Abscess—Lipiodol—Everett K. Geer and D. Greth Gardiner, St. Paul
Peripheral Vascular Disease—George E. Brown and Bayard T. Horton, Rochester
Congenital Anomalies of the Kidney—E. A. Boyden, Minneapolis
Primary Tuberculosis in Childhood—X-ray Films—J. R. McNutt, Duluth
Cauterization of Cervix—L. W. Barry, St. Paul
Schick Test—C. A. Stewart, Minneapolis
Technic of Examination of the Blood Smear—C. H. Watkins and F. J. Heck, Rochester
Method of Decompression in Simple Intestinal Obstructions—O. H. Wangensteen and J. R. Paine, Minneapolis
Professional Pharmacy as Applied to the Physicians—Under the auspices of the Inter-professional Relationships Committee of Hennepin County

GENERAL ASSEMBLY

11 A. M.
Presentation of Officers

Davis Method of Prostate Resection, with Moving Pictures—Theo. M. Davis, Greenville, S. C.
Results of Prostatic Resection—H. C. Bumpus, Jr., Rochester
Cystoscopic Prostatectomy—A Further Report—Frederic E. B. Foley, St. Paul

GENERAL ASSEMBLY

Surgical Hall—1 P. M.

Observations on Arterial Hypertension—Ralph Major, Kansas City
Discussion—George E. Brown, Rochester
Discussion—E. T. Bell, Minneapolis

CLINICS

Neurology—E. M. Hammes, St. Paul
Dermatology—Henry Nicholas Klein, St. Paul
Cardiology—C. N. Hensel, St. Paul; Ralph Major, Kansas City
Surgery—Harry Zimmermann, St. Paul
Pediatrics—T. L. Birnberg, St. Paul

FIRST-AID CLINIC FOR MINNESOTA HIGHWAY PATROLMEN

Medical Hall—1 P. M.

Kenneth Bulkley, *Presiding Officer,* Minneapolis
The Equipment Necessary for the First-aid Treatment of Fractures—Roscoe C. Webb, Minneapolis
Cuts and Bruises—J. J. Ryan, St. Paul
Head Injuries in Automobile Accidents—Adolph Hanson, Faribault
Hemorrhages—F. J. Plondke, St. Paul
First-aid Treatment to Common Injuries—Myron O. Henry, Minneapolis

FRACTURE CLINIC—Medical Hall

Demonstration and Discussion of Fractures at the Hip, Elbow and Ankle by the St. Paul Sub-committee of the General Fracture Committee of the American College of Surgeons—A. R. Colvin, *Presiding Officer,* St. Paul

Fractures at the Hip—WALLACE H. COLE and GEO. A. WILLIAMSON, St. Paul
Fractures at the Ankle—VICTOR P. HAUSER and WILLARD S. HOWARD, St. Paul
Fractures at the Elbow—C. C. CHATTERTON and C. CURRY BELL, St. Paul

SCIENTIFIC CINEMA—1 P. M.

Same Program as Tuesday Afternoon

SCIENTIFIC EXHIBITS

Minnesota State Sanatorium
  Demonstrations of Radiologic Examinations of Patients and of the Indians in Minnesota—H. A. BURNS, Superintendent, Ah-Gwah-Ching
Lymanhurst School for Tuberculous Children, City of Minneapolis
  Demonstration of Tuberculosis in Children—F. E. HARRINGTON, Department of Health, Minneapolis; J. A. MYERS, Lymanhurst School, Minneapolis
Minnesota Radiologic Society
  Radiologic Exhibit—B. R. KIRKLIN, President, Rochester; GAGE CLEMENT, Vice President, Duluth; LEO G. RIGLER, Secretary-Treasurer, Minneapolis
The Mayo Foundation for Medical Education and Research. This exhibit is being shown at the meeting of the American Medical Association at New Orleans this year
  Surgery of the Colon and Rectum—FRED W. RANKIN, JOHN DE J. PEMBERTON, L. A. BUIE, C. F. DIXON, A. S. GRAHAM
  Diagnosis and Medical Treatment of the Colon and Rectum—J. A. BARGEN, C. W. BROWN, H. M. WEBER
  The Coronary Circulation—MERRITT B. WHITTEN
  Coronary Occlusion and Myocardial Infarction—A. R. BARNES
  Plastic Surgery. Illustrations before and after treatment with Automatic Projector—GORDON B. NEW, F. A. FIGI
  Diet Research—W. C. ALVAREZ
  An Adequate Diet. A representative will be present to answer questions and discuss various diets—MARY FOLEY
  Ketogenic Diet—Its Use in Idiopathic Epilepsy—H. F. HELMHOLZ and C. J. BARBORKA, Rochester
The Work of the Medical School
  Statistics and Charts—R. E. SCAMMON, Minneapolis
Economics Committee, Minnesota State Medical Association
  Distribution of Population, Wealth, and Physicians in Minnesota—N. O. PEARCE, Minneapolis
Cancer Institute
  WM. A. O'BRIEN, Minneapolis
University of Minnesota
  Fundus Photography. Department of Ophthalmology, University of Minnesota.
  Tularemia. Charts of Distribution in Animals and of Animal Cycles. Wild Animal Specimens, Intermediate Insect Hosts, Pathological Specimens—R. G. GREEN, Minneapolis
  Comparative Pathology. Division of Veterinary Medicine—C. P. FITCH, Chief, St. Paul
Women's Auxiliary
  MRS. JAMES BLAKE, President, Hopkins
Glen Lake Sanatorium
  Methods of Treating Pulmonary Tuberculosis—Staff of Glen Lake Sanatorium, Oak Terrace
  Genito-urinary Tuberculosis—GILBERT J. THOMAS and T. J. KINSELLA, Oak Terrace
  Ano-rectal Lesions in the Tuberculous—W. K. FANSLER and C. K. PETTER, Minneapolis
Minnesota and Ramsey County Public Health Associations
  "The Doctor Sees the Case First."
  Education Material for Distribution in the Field of Tuberculosis and Heart Disease

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of May will be as follows:

May 4—Personal Hygiene—Care of the Body.
May 11—Boils and Carbuncles.
May 18—Mucous Colitis.
May 25—Fibroid Tumors of the Uterus.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The annual meeting of the American Association for the Study of Goiter will take place at Hamilton, Ontario, June 14, 15, 16, 1931.

The program provides for hospital clinics beginning at 7:15 each morning and so-called day clinics from 10 o'clock on. Many surgeons whose names are associated with the goiter problem in Canada and the United States appear on the program. Minnesota participants include Drs. C. H. Mayo, H. S. Plummer and F. W. Rankin of Rochester, and C. O. Rice of Minneapolis.

NORTHWESTERN PEDIATRIC SOCIETY

The annual meeting of the Northwestern Pediatric Society was held at the Town and Country Club, St. Paul, Minnesota, on March 30, 1932. Twenty-four members were present. Dinner was served at 7 P. M. At 8 P. M. the meeting was called to order by Dr. Samuel Amberg, President of the Society.

The following names were proposed for membership: Dr. Emanuel S. Lippman by Dr. S. J. Huenekens and Dr. Charles L. Steinberg by Dr. T. L. Birnberg. Both were elected to membership.

The Treasurer's report showed a balance in the Treasury on March 30, 1932, of $378.20.

The following officers were elected for the ensuing year: Dr. Irvine MacQuarrie, president; Dr. Alexander Stewart, secretary-treasurer.

The invitation to the Society from Herbert Bigelow to visit his Certified Milk Farm was introduced by Dr. Frank Hedenstrom. After some discussion the acceptance of the invitation was left to the discretion of the officers of the Society.

The scientific program consisted of an address by Dr. Dwight E. Minnich, Professor of Zoology, University of Minnesota, on "Some Aspects of Human Heredity," which was extremely well received and instructive, and was freely discussed by many members of the Society.

ALEXANDER STEWART, M.D.
Secretary-Treasurer.

RED RIVER VALLEY SOCIETY

Two North Dakota physicians, Dr. Henry Rudd of Grand Forks and Dr. Russell Gates of Minot, addressed the spring meeting of the Red River Valley Medical Society and its Auxiliary at the Hotel Crookston in Crookston, April 12.

Dr. Rudd's subject was "The Diagnosis and Treatment of Lateral Sinus Thrombosis." Dr. Gates, who is chief roentgenologist of the Northwest Clinic, discussed "Case Histories with Radiological Findings."

Dinner was served.

RICE COUNTY SOCIETY

Dr. M. S. Henderson, president of the State Medical Association, addressed the Rice County Medical Society on "Fractures" Thursday evening, April 7, at the Faribault Clinic rooms.

Other speakers on the same program were Dr. F. J. Savage, Saint Paul, whose subject was "Your Fifteen Dollars," and Dr. E. A. Meydering of Saint Paul, secretary of the State Association, who discussed medical economics.

SOUTH DAKOTA STATE MEDICAL MEETING

The fifty-first annual session of the South Dakota State Medical Association will be held at Langford, South Dakota, June 20, 21, and 22, 1932. An invitation is extended to the members of the Minnesota State Medical Association to attend.

UPPER MISSISSIPPI VALLEY SOCIETY

The winter meeting of the Upper Mississippi Valley Medical Society was held at Brainerd, January 27, with a large attendance and varied program.

The scientific program included a talk by Dr. F. G. Hedenstrom of Saint Paul on "Prophylaxes of Common Contagious Diseases," a moving picture film on "Spinal Anesthesia," a talk by Dr. James K. Anderson of Brainerd on "Treatment of Anal Fissure and Hemorrhoids."

An informal discussion of the Shoulders plan for veterans' insurance was a feature of the evening with Dr. W. W. Will, Bertha; Dr. G. J. Badeaux, Brainerd; Dr. Hedenstrom, and Dr. Anderson leading the discussion.

The following meeting places were selected for the year's meetings: Bemidji for the spring meeting; Little Falls for the fall meeting, which is to be held jointly with the Stearns-Benton County Medical Society; and Brainerd for the winter annual meeting.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

ST. LOUIS COUNTY AUXILIARY

On St. Patrick's Day the Duluth Women's Auxiliary were entertained by Mesdames Nicholson, Elias, and Forbes, at a luncheon. The purpose was to raise money for the Auxiliary's milk fund for needy families.

PARK REGION AUXILIARY

The Park Region Medical Society and the Auxiliary met jointly on April 13. The meeting was held at the River Inn, and during the dinner Mrs. James Blake spoke on the work of the Auxiliary. After the dinner the doctors adjourned for a scientific meeting, while a social hour was enjoyed by the Auxiliary. Mrs. C. O. Estrem of Fergus Falls is president of the Auxiliary.

STATE AUXILIARY

County presidents who have not filled out and returned nomination blanks sent them by Mrs. Baxter, should do so immediately. The nominating committee, composed of Mrs. Stephen H. Baxter, of Hennepin County, Chairman; Mrs. R. F. Meyers, Rice County; Mrs. J. C. Rothenburg, Redwood-Brown; Mrs. J. J. Gelz, Stearns-Benton; Mrs. C. K. Williams, Ramsey County, will meet the morning of May 23.

PROGRAM FOR STATE CONVENTION

Monday, May 23, 1932

Technical Exhibits—(Open from 6 until 8 P. M.)

AUDITORIUM THEATER

The Community Hospital—Edward A. Fitzpatrick, Dean Marquette University, Milwaukee
The American Legion—E. V. Cliff, Ortonville
The Public—F. R. Bigelow, St. Paul
The Doctor—Dr. Olin West, Chicago

Tuesday, May 24

Dutch Treat Luncheon—Women's City Club—12:30 P. M.
Greetings—Dr. M. S. Henderson
—Dr. George Earl
Executive Board members and visiting Auxiliary members all welcome
Executive Board Meeting—2:00 P. M.
Auditorium
All reports to be read at this meeting. All doctors' wives welcome.

BANQUET—Lowry Hotel—7:00 P. M.

Wednesday, May 25

GENERAL SESSION—Auditorium—9:00 A. M.

Report of the Executive Board Meeting
Round Table Discussion—"Problems of Everybody"—Led by Dr. O. E. Locken, Dr. S. H. Boyer, Dr. Carl B. Drake, Mrs. R. N. Jones, Mrs. H. M. Blegen, Mrs. J. W. Stuhr
Mental Hygiene—Dr. Louisa Kerschbaumer, St. Peter State Hospital
Echoes from New Orleans Meeting—Mrs. Sherman S. Hesselgrave, St. Paul
Election of Officers

ANNUAL LUNCHEON—Palm Room, St. Paul Hotel

1 P. M.

Music
"Adult Education"—R. R. Price, Extension Division, University of Minnesota, Minneapolis

WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

Tenth Annual Meeting

New Orleans
May 9-13, 1932

Headquarters: Jerusalem Temple, 1137 St. Charles Ave.

Preliminary Program

Monday, May 9, 1932

6:00 P.M.—National Board Dinner and Pre-Convention Meeting (for Board Members only), Orleans Club, 5005 St. Charles Ave.

Tuesday, May 10, 1932

9:00 A.M.—General Meeting. Mrs. Arthur B. McGlothlan *presiding.*
12:30 P.M.—Buffet Luncheon.

2:00 P.M.—Walk through Vieux Carre, with Guides. Starting from the Patio Royale.
8:00 P.M.—General Meeting of the American Medical Association. Auditorium.

Wednesday, May 11, 1932

9:00 A.M.—General Meeting.
12:30 P.M.—*Auxiliary Luncheon. Southern Yacht Club.
2:30 P.M.—Post-Convention Board Meeting. Southern Yacht Club.
New Orleans Country Club
8:30 P.M.—Divertissements in the Garden.
10:00 P.M.—Buffet Supper. Negro Spirituals—Courtesy of the Woman's Auxiliary to the Louisiana State Medical Society.

Thursday, May 12, 1932

9:00 A.M.—General Meeting. Mrs. Walter Jackson *presiding*.
10:00 to 10:50 } Special Round Table Conferences.
11:00 to 11:50 }
12:00 M. —Buffet Luncheon.
1:00 P.M.—*Trip to Oak Alley Plantation; visiting Spillway. Returning at 6 P. M. (Round trip, $2 per person.)
or
2:00 P.M.—*Round-trip over Lake Pontchartrain, via New Bridges. ($2 per person.)
or
2:30 P.M.—*Trip to Versailes Plantation, Battle Field of New Orleans; Docks and Wharves. (Round trip, $1 per person.)
or
2:30 P.M.—*Delgado Museum and City Park; Newcomb Art School and Audubon Park. (Round trip, $1 per person.)
or
2:30 P.M.—*Mayan Exhibit, Tulane University. (Round trip, 25c per person.)
9:00 P.M.—President's Reception and Ball. Auditorium.

Friday, May 13, 1932

9:00 A.M.—*Trip to Gulf Coast. Leaving L. & N. Station at 9:00 A. M., returning to New Orleans at 6:00 P. M. (Round trip, including luncheon and beautiful scenic drive along the coast, $6.00 per person.)
10.00 A.M.—Golf Tournament. Metairie Golf Club.

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*Transportation paid by individual.
All trips start from Jerusalem Temple.

THROMBOPLASTIN-LEDERLE (For Hypodermic Injection) NOT ACCEPTABLE FOR N. N. R.

Because of the lack of evidence for the therapeutic value of thromboplastic substances other than those designed for external use, the Council on Pharmacy and Chemistry has omitted from New and Nonofficial Remedies, preparations of thromboplastin designed for subcutaneous or hypodermic administration. The Council reports that Thromboplastin-Lederle, admitted to New and Nonofficial Remedies, 1923, was stated in the advertising to be intended for both external and internal use; that the firm's thromboplastin proposed for external use has been accepted for New and Nonofficial Remedies; and that, since the firm still markets a thromboplastin solution to be administered by hypodermic injection, this preparation has been declared unacceptable. (Jour. A. M. A., January 9, 1932, p. 143.)

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of February 10, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 10, 1932. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the President, Dr. J. C. Litzenberg. There were fifty-five members present.

Minutes of the January meeting were read by Dr. C. B. Drake, in the absence of the secretary.

The President then called on Dr. William Davis, of St. Paul, to read the minutes of the first meeting of the Academy, which was held on October 13, 1887, with Dr. Edward C. Spencer as Secretary. Dr. Davis presented the original copy of these minutes to the Academy and a motion was carried that they be placed in the permanent records of the Academy with this meeting of February 10.

The President announced the death of Dr. John Fulton, one of the oldest and best loved members of the Academy, and appointed a committee consisting of Dr. John Brown, Chairman, and Drs. S. M. White and J. S. Gilfillan, to draft resolutions on Dr. Fulton's death.

The following scientific program was given:

Dr. Kenneth Bulkley (Minneapolis) read his inaugural Thesis entitled "The Rôle of Oxyuris and Trichocephalus in the Etiology of Appendicitis." This was illustrated with numerous lantern slides showing serial sections of appendices. (To be published later in Minnesota Medicine.)

DISCUSSION

Dr. W. R. Ramsey (St. Paul): During the War I was in France for a year and a half with Dr. Park and our work was among the child refugees. Dr. Park came to the conclusion that these parasites were normal, at least in French children during the war; he found practically none of the children of that class that did not have pin worms. The very fact that it is so difficult to rid these children of these worms suggests in all probability that the appendix is involved and this may explain the recurrences of the worms. You think you have gotten rid of them and then so frequently they later recur. This may be the explanation.

Dr. A. Schwyzer (St. Paul): I think nearly all of us are a little stunned to see that the oxyuris on close examination should be so frequently found. I recall one little girl of 7 years. On opening her appendix, these oxyuris were so thick that they looked just like fur on the inside of the appendix. Still, the percentage in Dr. Bulkley's cases seems to me to be rather large. From now on we shall examine the removed appendices still more carefully than before. We always examine the appendix and make sections; but of course to make serial sections of the whole appendix is too much to ask of the laboratory man. It may be that we have not encountered oxyuris more often because we were not impressed with the necessity of looking very exactly for even young ones. Trichocephalus dispar I have not seen. I should not have said anything on this subject but for one thing which I recently read in the Zentralblatt fur Chirurgie, where it was urged to section the appendices longitudinally. The appendix is rolled up tightly and is then sectioned longitudinally. In this way the microscopic examination is greatly simplified and overlooking areas of localized trouble is much more easily avoided.

Dr. A. E. Benjamin (Minneapolis): I want to mention a case similar to the corollary by Dr. Bulkley in his paper. I recall one patient about eight years ago who had worms and who had had various treatments, but with no results. Her appendix was always tender and I thought perhaps a good way to get rid of the worms was to take out the appendix. She has had no further trouble since the operation. We found numerous worms in the appendix. I believe this is of more common occurrence than we think; the trouble is not cured by the usual treatment because the worms are in the appendix.

Dr. J. C. Litzenberg (Minneapolis): It would not have been necessary to go back to the Zentralblatt for that method, for in the *American Journal of Obstetrics and Gynecology,* June, 1920, that method was given in the making of sections of the whole Fallopian tube, which is comparable to the appendix.

I had a very unusual case where there was tuberculosis of the uterus, vagina, and tubes. I coiled them all up together and found the lesions in the coiled specimen clear from the vulva to the end of the tube. It is a good method.

Dr. A. E. Wilcox (Minneapolis) reported the following case of Extraperitoneal Cyst:

The patient, Mrs. C. M., age 39, was admitted to Eitel Hospital at 2 a. m. August 20, 1931. The present illness commenced on August 16, 1931, with uterine bleeding, at first slight in amount. The following day the bleeding ceased, and then continued irregularly, being bright red and, at times, dark clots only. The patient felt weak, with pain low in the back on both sides. The day of admission she experienced quite severe pain in the left lower quadrant of the abdomen. The pain was intermittent and was referred down the inside of the left thigh.

She had been operated for ectopic pregnancy, right side, in 1927. Her last menstrual period was May 25, 1931.

Examination showed a well-nourished woman of about the age given, complaining of severe pain on the left side. Pelvic examination showed marked tenderness and resistance in the left side, but no definite outline of any tumor could be made out, and mobility of the uterus was questionable on account of the pain. The cervix was negative.

Diagnosis was acute abdomen—(1) ectopic pregnancy; (2) ovarian cyst, possible torsion of pedicle.

Operation: On August 20, 1931, at 10:50 a. m., under spinal anesthesia (200 mgm. N_2O) a midline incision was made. There was no free fluid in the abdomen, but there were dense adhesions of the large and small bowel to the right cornu of the uterus and right broad ligament. A cyst about the size of a large lemon was found on the left side with its pedicle and the left tube twisted. This was located deep in the pelvis. A cyst about the same size was found on the right side. Adhesions of the large bowel were relieved and the serous covering of the bowel stitched with dulox sutures. Both cysts were removed without disturbing the other appendages. The right side had been operated (previous history). The wound was closed with plain for the peritoneum, chromic for the fascia, single layer reinforced with three or four interrupted sutures. Silkworm was used for the skin. The postoperative period was quite uncomfortable for four or five days, more so than usual, the patient having considerable distention, nausea, and repeated emesis; but from the fifth day post-operative until discharged her record shows nothing unusual and her temperature was normal. She was discharged Sept. 1, 1931, apparently well.

On September 8, 1931, she reported that since leaving the hospital backache and insomnia had been marked and recently she had pain in the left lower quadrant. In reviewing the case, I found she had complained some of pain in this area while in the hospital.

Examination showed the abdominal wound healed. On palpation a feeling of resistance was noted low in the left lower quadrant, and on vaginal examination not only a resistance to the left, but a palpable mass occupying a position to the left and downward from the uterus, which was smooth, slightly movable, and in size comparable to a four-months pregnant uterus. There had been no menstrual bleeding, but she reported some vaginal discharge. After the patient had urinated, the vaginal examination was repeated and the same findings were present, namely, a mass in the position of the uterus extending to the left and downward. Other examinations were negative.

On October 26, 1931, she reported that she had had one normal menstrual period. The same physical findings were present in regard to the mass. The leukocyte count was 12,000. No definite diagnosis was made, and exploratory operation advised. A scout X-ray film of the pelvis and mass was made, with negative deductions.

On November 6, 1931, under spinal anesthesia, a midline incision was made, dissecting out the previous operative scar. Upon opening the peritoneum above the mass, the omentum was found adherent to the parietal peritoneum. There was no free fluid in the abdomen. The left ovary appeared normal (evidently the cyst removed at the previous operation was of para-ovarian origin). The tube on the left side was distended with fluid (hydrosalpinx). This tube was removed. After a few adhesions to the surrounding structures were separated, the uterus could be brought up and inspected and it appeared to be normal although there were some adhesions on the right side.

The bladder was pushed over to the right side and backward, and the mass which had been felt previous to operation proved to be extraperitoneal and occupied a position to the left side of the bladder, in front of the uterus, and reached down to the symphysis pubis. The peritoneum was then closed above the mass, the abdominal muscles separated from the peritoneum, and the upper part of the mass came into view, which was somewhat regular, giving an impression of fluctuation. A line of cleavage was found and enucleation started. On the outer and anterior and also on the mesial side of this mass enucleation was more difficult as the adhesions were more dense. At one time the question of this mass being an obstructing diverticulum of the bladder was considered, but, inasmuch as it was extraperitoneal, this theory was discarded. A moderate sized needle was used to aspirate the mass and hemorrhagic fluid was obtained (a small amount for culture). Enucleation was then continued and eventually the mass was removed. It was about the size of a normal kidney and much the same shape. A small rupture occurred on its outer side during the process of enucleation, but this was clamped, no serious hemorrhage was encountered, and no definite connection of this mass to the other structures was found, it being enucleated en masse. The peritoneum was then closed with plain and a Penrose tube placed into the extraperitoneal bed from which the mass had been enucleated. The wound was closed with tier sutures, silkworm stay sutures, and clips for the skin. The postoperative recovery was progressive. The patient left the hospital November 19, 1931, and has remained well since.

Pathological report on specimen: Several sections were made of the wall and all show a rather uniform structure. The outer portion is composed of rather dense connective tissue with diffuse and focal infiltration of lymphocytes, plasma cells and an occasional neutrophile. The inner lining is covered with a membrane composed of red blood cells in various stages of disintegration. Just beneath this there is a band of cells showing marked phagocytosis of hemosiderin. No evidence of malignancy is seen. There are no structures resembling endometrial glands present. The sections have the appearance of a fibrous reaction to an escape of free blood into the tissues. Diagnosis: encysted hematoma. (Wm. A. O'Brien, Pathologist.)

DISCUSSION

Dr. J. L. Rothrock (St. Paul): It was my privilege to operate on a retroperitoneal cyst a little more than a year ago. These tumors of various kinds are not at all uncommon. In my case the tumor lay behind the cecum. At first I thought it might be a renal tumor but after further investigation we decided it probably was not. I thought of hypernephroma but it did not extend up as far as the kidney. I then thought it might be a cyst of the ovary with adhesions.

At operation we found this tumor was intraperitoneal, and lay behind the cecum. I divided the peritoneum over the cyst and then, to my surprise and satisfaction, it was the simplest thing in the world to enucleate it. It was attached by no blood vessels and had no pedicle. There was very little bleeding except where we divided the peritoneum over the cyst. It measured 15 by 12 by 9 cm., or a flattened oval in shape. It seemed to have a fluid which was dark in color and which was described as greyish brown. When it was opened, we found there were low papillary growths 1 cm. in diameter in one area of the cyst wall. The cyst wall was rather thin and showed nothing in particular. On microscopic examination this was found to be adenocarcinoma. This woman was 31 years old and the only symptom of which she complained was this tumor. A year after the operation there was no recurrence. I have not recently heard about her, but have written to inquire how she is.

One thing which makes me think the prognosis may not be so bad was that at no place had these papillary growths penetrated through the capsule. There were not many lymphatics leading from it. The chances for permanent cure were perhaps not so bad in that case.

Dr. A. E. Benjamin reported a case in connection with the paper on "Nasal Suction Treatment of Postoperative Vomiting, Pain and Dehydration." (To be published in Minnesota Medicine.)

This patient is a young single man 22 years of age, five feet six and one-fourth inches tall, weight 138 pounds, and is employed as an electrician. His health has been fairly good in the past with the exception of having had children's diseases; infection of the left hand and wrist in 1927, which required lancing and drainage; pneumonia in 1928; and in November, 1931, he had another slight infection of the left wrist. He has had a few attacks of tonsillitis. His general habits are good. He smokes about half a package of cigarettes a day. His family history is essentially negative.

On November 15, 1931, at about 8 a. m., while out hunting, he carelessly put his No. 22 (long) cocked revolver back into the holster on his right side. The revolver went off and the bullet diagonally entered the lower right quadrant of the abdomen. He at once drove his car a mile and a half to a farm house for help. He was taken to Dr. Arey at Excelsior, who gave him a hypodermic of morphin and first aid treatment, and he was then rushed to the Northwestern Hospital.

X-rays of the abdomen, taken on the day of admittance, show a somewhat diffuse haziness over the entire abdomen. There is one area of density at the level of the crest of the right ileum which simulated a metallic foreign body. Conclusions: Definite evidence of fluid in the abdomen. Determination of the presence of a metallic foreign body is not definite due to a movement and slow exposure of the portable machine.

The patient seemed in fair condition, pulse 80, temperature 97.4°. Although there was a rigid abdomen, especially on the lower right, he complained of little pain or discomfort. There was dullness in the lower abdomen. Upon evacuation of the bladder, the urine contained no blood. He was not in distinct shock so an operation was determined upon and performed three hours after the accident.

Under local, gas and ether anesthesia a right rectus incision was made just inside and above the anterior superior spine. The omentum was protruding through the muscle bullet wound. The abdomen contained much blood and clots, and the contents of the bowel had escaped and mixed with this. Saline solution with a suction was used to wash out the fecal matter from the abdominal cavity. The ileum was injured and punctured in nine places. The punctures and rents occurred in various places for about three feet along this part of the bowel. One area consisted of an injury to the mesentery for about 2 inches, causing considerable hemorrhage in the abdomen. At this point the bowel wall was not punctured. At a second area 2 inches in extent the bowel wall was ripped open on the side opposite from the mesentery and near the end of this area three small punctures existed near each other, two of them within ¾ of an inch, about the size of a slate pencil. The bowel was punctured by the bullet in other areas about the same size. The cecum was injured about 4 inches upward along the ascending colon but the wall was not completely severed. The rest of the intestine was examined up to about the middle of the jejunum, as well as the sigmoid, rectum, and ascending colon, but no injury was found. The iliac vessels seemed to be intact and apparently there was no bleeding from that source. The bullet was not found. It may have entered the bowel and been later evacuated.

All the raw and lacerated areas were carefully stitched with Dulox, turning the raw edges in. The circulation in one area where the bowel had been greatly lacerated was somewhat impaired, but this area was stitched in such a way that the remaining portion seemed to be well supplied with functioning blood vessels. All the areas involved were brought within a small space just below the incision, the omentum covering these areas, and four Penrose drains extended into the pelvis below these injured coils. The abdomen was closed with chromic No. 1 with the muscle and peritoneum included. Four dermal stay sutures tied over a roll of gauze were put in the inner side of the incision. The skin was closed with chromic No. 0.

The patient stood the operation very well. There seemed to be very little shock. On the second day after the operation the patient's abdomen became distended and he complained of distress and pain in the back, and he had eructation of gas. A Levin catheter was then passed through the nasal cavity into the stomach and this was attached to a tube connected with an inverted suspended bottle filled with water. This bottle was connected to a bottle on the floor to permit continuous suction to remove the gas from the stomach. I have used a similar plan on cases in the past but was not able by that method to measure the gas removed or the fluids absorbed. Dr. Wangensteen, of the Surgical Department of the University Hospital, has employed a more elaborate method whereby the gas removed and the fluids absorbed can be measured. His plan I adopted in this case, with marked success, as will be noted on the symptom chart herewith. (The use of this continued suction apparatus was shown on the screen, as well as other charts with symptoms and progress.)

The urine was negative upon admittance to the hospital, but on the third day there was a slight trace of albumin, indican, many mucous threads, occasional epithelial cells, and two to six pus cells. On the fifth day albumin was still present and a rare hyaline cast, with ten to fifteen pus cells. On the twenty-first day there was again a slight trace of albumin.

The day after his operation his temperature went up to 102.8°, pulse 110, and respirations 28. For the next five days the temperature fluctuated between 100° and

102°, after which time it gradually declined so that on the 10th day it was normal and remained about normal until he left the hospital. Up to the tenth day his pulse was between 85 and 100, but after that day it remained practically normal. There were no respiratory complications.

This case demonstrated the benefits derived from the continuous suction apparatus, which has the following advantages: (1) relieves pain; (2) necessitates fewer hypodermics; (3) is a distinct psychological benefit; (4) prevents vomiting; (5) permits the patient to drink freely; (6) increases the comfort of the patient; (7) permits more rest and sleep; (8) reduces the temperature; (9) lessens intra-abdominal tension; (10) decreases the possibility of spreading peritonitis; (11) occasions earlier bowel function; and (12) hastens recovery and reduces mortality.

DISCUSSION

Dr. Rothrock: Did I understand Dr. Benjamin correctly, that he did not pass the tube into the duodenum?

Dr. Benjamin: It was put just into the stomach. I have some X-ray slides which may show that, although possibly not very clearly.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

PROCEEDINGS MINNEAPOLIS SURGICAL SOCIETY

Meeting of March 3, 1932

The President, Dr. J. Frank Corbett, in the chair.

The following scientific program was given:

Dr. Roscoe C. Webb presented the specimen and reported the case of a girl fifteen years of age first seen at 8 o'clock in the evening of Tuesday, June 24, 1930, with pain in the right lower quadrant of the abdomen which was cramplike and very severe. Her father had returned from a successful fishing trip on Saturday, four days previously, and she had eaten fish on Sunday and Monday. At two o'clock in the afternoon, six hours previously, while riding in an auto she began to have pains in the lower abdomen on the right side and the severity gradually increased until at the end of six hours the pains were very severe and the doctor was called to see her.

Her past history was unimportant. There was no previous history of gastrointestinal disturbance. She had had pyelitis four years previously.

The general physical examination was that of a well-developed girl who was entirely normal except for the abdomen. There was marked tenderness in the right lower quadrant extending well down toward the pelvis. There was marked rigidity throughout this tender area but no distention. The temperature was 100°, pulse 72, and respirations 20. The white blood count was 13,700 and the differential showed 69 per cent polymorphonuclears, 29 per cent small lymphocytes, and 2 per cent large mononuclears. The urine was normal.

The patient was operated upon by Dr. Webb at Northwestern Hospital about nine hours after the onset of symptoms as follows: Using nitrous oxide and ether anesthesia, a four-inch lower right rectus incision was made. On opening the peritoneum the small intestine which presented was found to be inflamed and on searching for the appendix turbid fluid was found in the right lower quadrant and also in the pelvis. The fluid was not walled off. A swab of the fluid was sent to the laboratory for smear and for cultures. The appendix was readily found and delivered and was moderately long and showed evidence of a previous inflammation but was not acutely inflamed at the time. The appendix was ligated and the stump was cauterized and inverted. A search was made for the cause of the peritonitis and the patient was placed in the Trendelenburg position after aspirating the fluid and the pelvic organs were examined visually. At the same time, about the level of the brim of the pelvis, he saw what appeared to be about one-half inch of number one catgut lying on the surface of one of the loops of intestines and on closer examination he found that this was lying on a Meckel's diverticulum which was only slightly inflamed near its tip. The Meckel's diverticulum was about the size of the thumb of an ordinary rubber glove and the object on the diverticulum was a fish bone which had perforated the diverticulum about one-half an inch from its tip with the sharp end sticking out and the larger end of the fish bone still within the lumen of the diverticulum, thus permitting a constant escape of the intestinal contents. The diverticulum was ligated and removed and the stump inverted with a double row of Lembert catgut sutures. A Penrose drain was placed in the pouch of Douglas and brought out at the lower angle of the wound. The wound was closed in tiers using dermal for the skin.

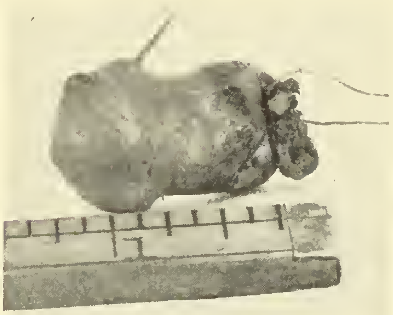
Convalescence was quite uneventful. The maximum temperature was 101°, pulse 108, and respirations 24. The drain was completely removed on June 29, five days after operation. The patient was discharged from the hospital on July 11, 1930.

In the February, 1932, issue of the *Annals of Surgery*, under the Transactions of the Philadelphia Academy of Surgery, meeting of October 5, 1931, Dr. Walkling reported the case of a boy eight years of age admitted May 5, 1930. The patient had eaten fish three days before and on operation an abscess was found in the center of which there was a Meckel's diverticulum, perforated by a fish bone. Recovery occurred. Dr. Walking remarked that this condition was reported only once before. (Blanc, H.: Bull. et Mem. Soc. de Chirurg. de Paris, Vol. xxi, p. 378, 1929.) This patient, a man forty-one years of age, was operated upon in 1898. The patient's symptoms had begun ten days previously. After five days' observation the patient was operated upon and a hard fibrous mass was found and when freed was found to be a Meckel's diverticulum, which was resected. It was found to have a fish bone in its wall. Recovery was uneventful.

A woman forty-five years of age was reported in April, 1900, by Piquand and Grenet in the Bulletin and Memoirs of the Societe anatomie de Paris. She had had abdominal pains for one year, and eight days before admission her symptoms became acute. There was a large tender mass in the abdomen and she was observed for five days, at the end of which time she died in coma. There was a localized abscess, in the center of which was a Meckel's diverticulum perforated by a fish bone.

Hagler and Stewart, in the *Journal of the American Medical Association,* May 15, 1920, reported the case of a man aged thirty-nine years who had had abdominal pain for two days and the symptoms suggested acute appendicitis. On operation a Meckel's diverticulum was found in an omental mass and a fish bone was found perforating it. It was necessary to resect about six inches of the ileum. A general peritonitis developed and the patient died six days after admission. These authors stated that they had found reference to but two other cases of perforation of Meckel's diverticulum by a fish bone.

Dr. Webb stated that, in his search of the literature, he had been able to find but four other case reports of this rare condition and it would appear that this series of five cases is the largest number thus far collected. The diverticulum described by Meckel occurs in a very small percentage of cases. The percentage of humans who swallow fish bones is also small. However, when one operates for acute appendicitis with perfectly good reasons and a normal appendix is found, the diverticulum of Meckel should be kept in mind and a search made.



Meckel's diverticulum showing the fish bone in the position found at operation (actual size).

Dr. E. A. Regnier reported the following case of "Carcinoma of the Lower Ileum with Complete Intestinal Obstruction of Three Weeks' Duration":

The patient, Mr. C. G., male, aged fifty-two, a railroad brakeman, was admitted to General Hospital August 4, 1931. (Discharged Oct. 17, 1931.)

He had had intermittent cramp, colicky pains in the abdomen of several months' duration, more severe the past three weeks. There had been nausea and vomiting daily for the past two weeks; and he had had no stools for the past two weeks.

The onset of the illness had been gradual. The colicky pains began in the right side of the abdomen and radiated to the lower abdomen, and eventually the colic involved the entire abdomen. The patient said he had been hearing gurgling and tinkling sounds accompanying the colic. Under advice of his physician he took nothing but liquids by mouth, and also took daily enemas. The first week of his illness the stools were very small, and there had been none for two weeks. There had been no bloody stools.

He had had an appendectomy in 1929; otherwise his past history was non-essential. Gastrointestinal studies made in 1929 were reported normal.

The physical examination showed a white male, much undernourished, who appeared to be in very severe pain. The pupils were equal and reacted. The tongue was furred. Blood pressure was 138/86. The examination was entirely normal except for the loss of weight, marked abdominal distention, tympany throughout the abdomen, and loud metallic sounds audible on auscultation over the abdomen at the acme of peristalsis. Peristalsis was visible over the entire lower abdomen.

After attempting to determine the origin of the obstruction and partially replenish the fluid loss in this patient, the abdomen was explored under spinal anesthesia on the 8th day of August. There was a large amount of free fluid in the abdomen. The entire ileum was distended to a diameter of about four inches and the wall was markedly thickened. Due to terrific intra-abdominal pressure, several loops of the bowel had herniated through the foramen of Winslow. There was a constricting mass about five centimeters long and three centimeters in diameter completely obstructing the ileum about six inches above the ileocecal valve.

Laboratory findings on his admission to the hospital were: Wassermann negative. Urine showed a faint trace of albumin. Blood: Hb. 90 per cent, R. B. C. 4,500,000, W.B.C. 9,000; blood chlorides 396 mgms. per 100 c.c.; blood urea 22.2 mgm.; Van Slyke 62 per cent. Occult blood was found in two stool specimens.

The patient developed bronchial pneumonia following the first operation. He was very toxic for ten days. The enterostomy functioned perfectly and the patient was able to eat well and gained in weight.

Under general anesthesia the patient was operated on the 22nd day of September, at which time the terminal fifteen inches of ileum, the entire cecum and ascending colon to the mid-transverse colon was resected and an end-to-end anastomosis was done between the ileum and transverse colon.

Convalescence was very uneventful. The patient gained in weight rapidly and at the present writing has regained his normal weight.

Pathologist's report: Specimen consists of loops of bowel as described above. Six inches above the ileocecal valve the ileum was constricted and on opening shows a villous mass filling the lumen for 5 cm. An enlarged node is present in the mesentery. The ileum above the stricture measured 15 cm. in circumference.

Microscopic picture: The tumor has a papillary structure and consists of glandular tissue. There is dense fibrosis of submucosa and serosa which contains nests of deeply staining epithelium and atypical glandular structures. The muscular coat of the gut is enormously hypertrophied.

Diagnosis: Papillary adenocarcinoma of the terminal ileum.

The significant features of this case are (1) the duration of complete obstruction without fatal outcome, and (2) the rarity of the lesion.

In 17,000 autopsies at the University of Minnesota there were only five cases of carcinoma of the ileum. The diagnosis of obstruction in this case was very obvious. X-ray is of no help in locating these lesions and is usually contraindicated. In complete obstruction X-ray is of much help in ruling out other lesions, namely in the colon or stomach.

Rankin states that about three per cent of cancers of the intestinal tract occur in the small intestine. In a twenty-year period in the Mayo Clinic only fifty-five cases of cancer of the small intestine were reported. This type of tumor must be differentiated from the so-called carcinoid tumors of the small intestine, 80 per cent of which are benign.

Ewing divides cancer of the small intestine into those developing from carcinoid tumors, or from polyposis, or from true localized adenocarcinoma. From a review of the literature, the prognosis is poor. The Mayo Clinic reports no three-year cures.

Dr. A. F. Bratrud reported a case of "Meckel's Diverticulum in a Strangulated Hernia."

The patient, Mrs. A. M., was a female, aged 50, Swedish, occupation housewife. Her father and mother are dead of unknown cause. She has one brother, aged 63, living and well, and one sister living and well.

This patient was first seen by Dr. Bratrud on July 7, 1930. She had been seen ten days previously by Dr. Wahlquist, Minneapolis, for pain in the lower abdomen accompanied by nausea and vomiting. The pain began in the right lower abdomen and became cramp-like in character. She had been nauseated during the entire period of ten days. She vomited daily with the exception of three days. During the past four or five years she had been wearing a truss for a hernia in the right lower abdomen. Her appetite had always been good; bowels were regular. The urine was normal. Menstruation began at the age of thirteen, and had been regular up to the persent time, with the exception that now they occur every five or six weeks. She has had six children, three of which died during infancy; the other three are living and well. Since the present attack began ten days ago she has been constipated, but the bowels moved with an enema. She had had no night sweats.

Examination is that of a well-nourished and well-developed woman about fifty years of age. Her blood pressure is 153/90; pulse 95. The examination of the eyes, ears, nose and throat is normal, with the exception that her hearing is not very acute. There is no adenopathy and no enlargement of the thyroid. Breath sounds were normal in both chests, with the exception of a few moist râles at the left base. The heart is normal in outline but there is a soft systolic murmur at the apex. The abdomen is rather pendulous, with moderate distention and with a mass slightly larger than a hen's egg in the right inguinal region. This mass is very hard and firm and moderately tender to pressure. There is no fluctuation to be determined. It is not reducible. There is dulness in this mass on percussion. There is no other mass to be felt in the abdomen.

The reflexes were normal, and all motor function was normal. Urinalysis showed a faint trace of albumin, with a very slight reduction for sugar, and a large number of pus and red cells.

A diagnosis of strangulated right inguinal hernia was made on this patient when seen by Dr. Wahlquist on June 29, 1930, but the patient refused operation continually until July 7, 1930.

Operation was performed on July 7, 1930, at which time there was a mass 2.5 × 0.5 inches in length in the right inguinal region. This was very hard and very firm. Under local anesthesia, infiltration being made at a distance from the mass, a right inguinal incision was made. There was a peculiar greenish discoloration of edematous tissue surrounding this mass. It was very difficult to separate the tissues down to the mass and determine the character of same. A Farr spring retractor was placed in the wound and in so doing one of the arms of the retractor slipped and punctured the mass. There was an immediate discharge of gas which had a fecal odor. Wet packs were at once placed around the mass and the wound was washed with S. T. 37 solution. An opening was made above the inguinal incision in order to observe better the character of this mass, as this woman did not have a complete intestinal obstruction at any time. The incision was gradually brought to the neck of the mass, and at that point there was a gangrenous area which involved a loop of the ileum and part of its mesenteric attachment. A resection of the ileum and part of the mesentery which was gangrenous and an end-to-end anastomosis were performed. A number eight rubber glove was packed with gauze and this was placed within the abdominal cavity and the wound was strapped. No sutures were placed in the wound.

Pathological report: The specimen which was removed consisted of a large piece of tissue matted together with adhesions. The organ removed is hollow and lined with a folded mucous membrane. This is either intestine or a diverticulum from the intestine. There is a hard area which is being sectioned. This tissue shows a necrosis which has destroyed the organized tissue near the serous coat. Many pus cells and eosinophiles are present. The epithelial layer is made up of glands consisting of high columnar cells, containing mucus. I can't tell whether or not it is intestine or a diverticulum. (Floyd Grave, pathologist.)

Postoperative treatment consisted of normal saline solution intravenously, pantopon whenever necessary for pain, and ergot twice daily. Perfringens vaccine was given intramuscularly.

There was never any very severe reaction following the operation, but there was a very profuse purulent discharge from the wound. There was no nausea, vomiting, distention, nor pulmonary complications following the operation. By July 13, 1930, all of the gauze was removed from the glove and the glove was loosened. This was removed two days later. On July 18, 1930, there was still quite profuse drainage from the wound, but it was healing nicely and the edges were very clean. On August 4th, the wound was practically healed. There was practically no drainage at this time except from the granulation tissues. The bowels had been moving regularly since the date of her operation. She was discharged on August 4, with no evidence of a hernia. She was last seen September 10, 1930, at which time the wound was very well healed and there was but a very slight bulging in the operative wound. This could not be interpreted as a recurrent hernia. She has been free from any symptoms since her operation.

It was impossible in this case to determine whether this was a Meckel's diverticulum in an inguinal hernia, or a Richter's hernia. It was impossible, while making the dissection, to determine whether this was a hard tumor or a tumor consisting of a hollow viscus, until the mass was punctured by a retractor.

Dr. Bratrud wished particularly to emphasize the nice healing which results from this form of treatment of wounds and the complete absence of any reaction in the tissues surrounding the wound following an operation where it is so treated.

DISCUSSION (OF PRECEDING CASE REPORTS)

Dr. A. T. Mann asked how large the mass was in Dr. Bratrud's case?

Dr. Bratrud stated it was about two and a half inches in diameter and round.

Dr. Mann stated that these Meckel's diverticula are very interesting to him; he had seen four cases. There were several points he wished to bring out. In the first place it is almost impossible to make a diagnosis correctly before operation; and no one really knows that he has a Meckel's until he sees it. Dr. Mann suggested that in Dr. Bratrud's case it may have been bowel.

Dr. Mann further stated that a Meckel's diverticulum is subject to all the inflammations that the appendix is and is much more difficult to diagnose than trouble with the appendix. Besides that, it has all the troubles of the bands and cords and twists causing obstruction; so that when there is inflammation in a diverticulum one is quite likely to get more or less obstruction with it also. In regard to the degree of inflammation, one may get everything up to perforation in a Meckel's, and Meckel's occurs in one or two per cent of all people. For diagnosis, a Meckel's is much more free than the appendix and on account of its freedom and its larger size and poor blood supply, it is more apt to have a more rapid perforation than the appendix. The diagnosis is more difficult to make because it can be in more places than the appendix can. One knows just about the range an appendix can have. Then, too, if there is inflammation it is much less likely to be walled off than the appendix, so that, unless the Meckel's is pretty much up toward the midline, one can't even make a guess that it is a Meckel's which may be inflamed. R. M. Harbin, of Rome, Georgia, was formerly abroad with him, and Dr. Mann stated that he gets reports from his hospital each year. Dr. Harbin reported a year or so ago on over 2,600 cases of operations, and stated that the greatest cause of death was appendicitis (25 per cent), and the next greatest was obstruction of the bowel (16 per cent); but the point which interested Dr. Mann was that 10 per cent of these obstructions were due to Meckel's diverticula. A Meckel's, then, can give one the obstruction and, in addition, all the troubles that one encounters with the appendix, including foreign bodies; and the foreign bodies much more easily get into the Meckel's diverticulum. Dr. Mann said he has seen pins and also grape seed in the appendix and cited the case of one man who had eaten a whole basket of grapes at one sitting and at operation the acute appendix was found full of grape seeds.

Of late more cases of Meckel's are being reported. Peptic ulcers, similar to those of the stomach and duodenum, have been reported. In some of these ulcer cases, heterotopia has been found and microscopic sections of the mucous membrane have shown mucous membrane identical in structure with that of the stomach. Some of these cases have been discovered because of large hemorrhages and melanotic stools. In other cases the hemorrhage is smaller but, because of the thin-walled gut, they lend themselves rather readily to perforation and extravasation.

In conclusion, Dr. Mann stated that the diagnosis of Meckel's is difficult until one gets into it; that the dangers are very much greater than those of appendicitis; and, if it is a case of inflammation, the perforation is much more rapid. There is more apt to be a spreading peritonitis and these latter cases result in more deaths than similar cases of appendicitis. Besides, they are often accompanied by intestinal obstruction, with strangulation, necrosis and gangrene. And in a considerable number, the necessity for an intestinal resection adds materially to the dangers.

Dr. S. R. Maxeiner said Dr. Webb's case of foreign body in a Meckel's diverticulum reminded him of a case he reported at the Western Surgical Association, of a patient who came to St. Mary's Hospital with a very acute abdominal complaint which was not entirely typical of appendicitis. At the onset of the complaint the patient was in North Dakota and was not seen by Dr. Maxeiner until three or four days after the beginning of the attack. On opening the abdomen, the appendix was found not to be the cause of the attack, but the sigmoid with an extremely redundant mesentery was lying on the right side of the pelvis. A fairly large mass presented which, when opened, was found to contain an abscess in the center of which was a toothpick lying freely in the abscess cavity and which had penetrated a diverticulum of the sigmoid. The abscess was largely on the right side because of the position of the sigmoid.

Dr. Maxeiner also reported a case of obstruction from Meckel's diverticulum operated upon by him at the Minneapolis General Hospital. He also encountered an acute diverticulitis in which the diverticulum was removed, and one case of diverticulitis had been encountered in which he had done no operation whatever because it appeared merely as a bulging area on the side of the ileum with free opening into the bowel and was causing no complaint.

Dr. O. H. Wangensteen stated that these were very interesting cases, and that the comment that he desired to make concerned only the features of bowel obstruction. The most outstanding consideration in bowel obstruction is the appalling mortality. In reported statistics it appears that the risk borne by one patient with acute intestinal obstruction equals that shared by ten patients having acute suppurative appendicitis. Whereas the potential danger to life of a perforated duodenal ulcer would appear to be far greater than of mere obstruction to the continuity of the bowel, the actual danger incurred by the patient with bowel obstruction as judged from the general mortality of these two disasters is twice as great.

The danger is largely that of delay. In a hospital whose resident and attending staff are "obstruction-minded," postoperative obstructions are early recognized. The complaint of these patients is usually that of "gas pains," which often go unheeded until vomiting occurs. The diagnosis of acute intestinal obstruction should be one of the easiest of acute disorders of the abdomen to recognize. If one will determine the presence or absence of *intestinal colic* by noting whether loud intestinal borborygmi are heard with the stethoscope at the acme of the pain, he has gone far to establish a diagnosis. The other colics of the abdomen, such as biliary, appendiceal, or renal colic, do not present loud intestinal noises, significant of increased peristaltic activity, at the height of the pain. When the presence of intestinal colic has been determined, it only remains to say whether this is acute intestinal obstruction, enterocolitis, food poisoning, abdominal allergy or simple "belly-ache," and on the general symptoms such as nausea, vomiting and diarrhea, a good appraisal or evaluation of the intestinal colic can usually be made.

Dr. Wangensteen said there were two therapeutic agents, the use of which he wished to discuss briefly. One is the employment of saline. It should be remembered that saline exhibits the virtues of a specific only in high intestinal obstruction. In low intestinal obstruction it is in no sense a specific, its greatest worth lying in combating dehydration. Dr. Wangensteen stated that it was not his observation that patients with low obstruction were improved very much as operative risks by a prolonged delay for saline administration. Only when the patient is badly dehydrated and the X-ray film indicates that the bowel distention is not great can prolonged delay be justified.

Dr. Wangensteen stated that since August, 1931, he had employed nasal catheter siphonage for decompressing the bowel in simple obstruction of the intestine without strangulation features. Of the seven cases seen since that time, all but one were successfully decompressed with nasal suction alone without operation. The third case was subjected to enterostomy after 12 hours suction when no appreciable diminution of the distention was visible on the X-ray film, and he convalesced smoothly. Since then Dr. Wangensteen stated that he had succeeded in decompressing a case exhibiting even more marked obstructive features. In the case in which enterostomy was done, the catheter could not be gotten into the duodenum.

The rationale upon which a decompression can be effected by this method, Dr. Wangensteen explained, resided in the fact that the chief source of intestinal gas is swallowed air. After the decompression is accomplished, in the absence of an intrinsic obstruction in the intestine, the intestinal continuity is automatically established.

Resection and primary anastomosis in the presence of a strangulated non-viable gut, Dr. Wangensteen felt to be a hazardous procedure. In such instances he thought it much wiser to exteriorize the devitalized bowel and establish the continuity by a secondary anastomosis. The combined risks of these two procedures he felt would not approximate the risk borne by the patient when a primary resection was done. In his monograph on bowel obstruction, Wilhelm Braun, of the Friedrichshain Hospital in Berlin, writes that their mortality in strangulated external hernia with non-viable gut in which resections were done was over 50 per cent.

Dr. J. A. Johnson stated that about ten years ago, in 1922, he first became interested in Meckel's diverticula. At that time he collected three cases in which a Meckel's diverticulum was the cause of intestinal obstruction. Since that time he had had no one other case. He felt it was a very interesting subject and he appreciated hearing the cases reported tonight. In connection with Dr. Webb's case, he wished to state that he did not know whether a fish bone is more likely to perforate the intestine than anything else. During past years he had the experience of seeing several cases of swallowed foreign body. One child had swallowed ten pins, and they all passed through without any accident. Two other children had swallowed open safety pins. On the other hand, one would think that swallowing of fish bones is not so common. He had seen one case which had perforated the intestine and caused an abscess in the abdominal wall, where the fish bone was found at operation. He wondered if fish bones more frequently perforated the bowel than other sharp foreign bodies. And where there is a Meckel's diverticulum and a fish bone perforating that diverticulum, Dr. Johnson thought was a rare case.

Dr. R. C. Webb thanked the members for their discussion but was not surprised that there was no one in the society who had had a case of Meckel's diverticulum perforated by a fish bone even in this state which is so noted for its fishing.

Dr. Webb also referred to the method of drainage described by Dr. Bratrud and felt that it was noteworthy that the discussion did not show that Dr. Bratrud's enthusiasm was more general in the Society. Mikulicz, many years ago, drained many wounds by placing a gauze sack in the wound and stuffing it full of gauze. Gibson, about twenty years ago, modified Mikulicz's method by using a large piece of rubber-dam instead of the gauze sack. The rubber-dam makes the tampon much less painful and the folds about it and the holes in it afford satisfactory drainage. Dr. Webb presented a paper on this subject before this society nine years ago and he felt that Dr. Bratrud's use of a rubber glove was a very good substitute when operating in hospitals where the rubber-dam was not available. He felt that the surgeon who would try the use of this method of drainage would soon be brought to share Dr. Bratrud's enthusiasm.

Dr. William T. Peyton read his Inaugural Thesis entitled "Report of a Case of Tumor of the Thoracic Vertebra with Complete Paraplegia. Treatment with Radium with Complete Cure and Return of Function. Experimental Work Showing the Action of Radium on the Spinal Cord."

ABSTRACT

The cases here reported were cases of myeloma involving the thoracic vertebræ with compression of the spinal cord resulting in paraplegia.

The first case was treated by laminectomy and insertion of radium, this followed by high voltage X-ray therapy, with the result that the patient has been clinically free from symptoms up to the present time, eighteen and a half months after operation.

The second patient is one who had laminectomy only; this was followed by slight improvement. He is now receiving high voltage X-ray therapy. It is four months since the laminectomy was performed.

The results are reported of some experiments which were performed in an effort to determine the effect of radium upon the spinal cord of dogs. Photomicrographs of the cords of these animals removed after being exposed to different doses of radium are shown. Changes are produced in the meninges, and in the cord proper by this exposure to radium. The intensity of these reactions is directly proportional to the amount of radiation. The changes noted are a meningeal reaction over a localized area at the site of the implantation, characterized by infiltration of leukocytes. Changes in the cord proper are nerve cell injury and glial proliferation with smaller doses, but in larger doses there is nerve cell destruction, myelin degeneration, hemorrhages, and even fragmentation of the gray matter and focal necroses in the white matter. The maximum dose of radium placed extradurally which was tolerated without resulting paralysis was 1.7 millicuries.

DISCUSSION

Dr. S. H. Baxter said he was interested in Dr. Peyton's experimental work on the effects of radium on the tissue of the central nervous system. In considering these effects, it is necessary to bear in mind that radium, in its physical properties, is not a simple element and that its effects depend upon the manner in which it is applied. In the experimental work cited by Dr. Peyton, the radium was used in the form of emanation, in seeds, in which there is little filtration or protection against the alpha rays. This supposition is strengthened by the fact that, in the experiments cited, the destructive effect was in the immediate vicinity of the seeds. On the other hand in the operation which Dr. Peyton reported, the radium was applied in a metal needle so that although the dosage, measured in milligram hours, was a good deal greater than that which produced destructive effects when seeds were used, still there was apparently no harmful effect upon the cells of the spinal cord after exposure to the radium in the metal needle. Dr. Baxter said he had frequently exposed peripheral nerves to large amounts of radium heavily screened, without harmful effects upon the nerves, but he realized that the cells of the central nervous system were probably much more sensitive to radium than were the peripheral nerves. He asked Dr. Peyton whether he had any experimental evidence on the effects of radium, heavily screened and applied at some distance from the cord, upon the nerve cells.

Dr. Peyton (in closing) stated, in regard to filtration, that the alpha rays are filtered out in these seeds because it is 0.2 millimeters of gold. The nickel-steel is 0.5 millimeters, but gold is a better filter than nickel-steel. As far as the use of radium in the axilla is concerned, it is generally admitted that the peripheral nerves are very radio resistant. Dr. Peyton said that apparently very little actual work has been done on the effect of radium on the peripheral nerves.

As far as the cord getting more radiation from these needles which he had used in the clinical case, in comparison to the dogs which were experimented on, Dr. Peyton said it really got less because he had put these out at a distance; and the effect of radiation decreases so greatly with distance that when he figured this out in terms of skin erythema doses he found the clinical case actually got less.

The annual election of officers took place at a business meeting which was held immediately following the scientific program, and the following officers were elected for next year: President, Dr. Kenneth Bulkley; vice president, Dr. Martin Nordland; secretary-treasurer, Dr. F. A. Olson. Council members: Dr. R. C. Webb was elected in place of Dr. White, whose term expired; Dr. A. E. Regnier was elected to fill Dr. Nordland's unexpired term.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Medical Formulary. E. Quin Thorton, M.D. Assistant Professor of Materia Medica of Jefferson Medical College. Philadelphia. 352 pages. Price, $2.50, flexible binding. Philadelphia: Lea & Febiger, 1932.

Psyllium Seed: The Latest Laxative. Dr. J. F. Montague. Medical Director Montague Hospital for Intestinal Ailments, etc. 170 pages. Illus. New York: Montague Hospital for Intestinal Ailments, 1932.

Modern General Anesthesia. James G. Poe, M.D. Lecturer on General Anesthesia in Medical and Dental Departments of Baylor University, etc. 231 pages. Illus. Price, $2.50 cloth. Philadelphia: F. A. Davis Company, 1932.

The Way of Health Insurance. A. M. Simons and Nathan Sinai. Research Staff of Committee on the Study of Dental Practice of the American Dental Association. 215 pages. Price, $2.00, cloth. Chicago: The University of Chicago Press, 1932.

Growth and Development of the Child. Part III. Nutrition. Report of the Committee on Growth and Development, Kenneth D. Blackfan, M.D., Chairman, White House Conference on Child Health Protection. 532 pages. Price, $4.00, cloth. New York: The Century Co., 1932.

Fertility and Sterility in Marriage. Th. H. Van de Velde, M.D., formerly Director of the Gynecological Clinic at Haarlem, Holland. Translated by F. W. Stella Browne. 494 pages. Illus. Price, $7.50. New York: Covici-Friede, 1932.

Nutrition Service In The Field. Child Health Centers: A Survey. White House Conference on Child Health Protection. 196 pages. Price, $2.00, cloth. New York: The Century Company, 1932.

Obstetric Education. White House Conference on Child Health Protection. 302 pages. Price, $3.00, cloth. New York: The Century Company, 1932.

THE HUMAN VOICE. Leon Felderman, M.D. First Edition. Cloth. Price $2.50. 294 Pages, with illustrations. New York: Henry Holt and Company, 1931.

This handy-size book, written in popular style, supplies topographical knowledge of the upper air passages and their common disorders. It is offered as an auxiliary to vocal instruction and has been compiled to bridge over the difficulties between vocal teacher and pupil: to bring them closer together on the common ground of knowledge. The anatomical descriptions are given in terms understandable to the layman, and the line drawings, excepting those pertaining to the nose, are good.

The author maintains that vocalization and its esthetic qualities cannot satisfactorily be taught to large groups. Each individual pupil must have his particular teacher.

In the chapter on swimming, he states that indoor or tank swimming is far less dangerous than outdoor swimming. He stresses the dangers of forcibly blowing the nose right after swimming. Those individuals with a history of discharging ears, perforation of the drum membrane, or sinus infection should be regarded as bad swimming risks unless examination by a competent otolaryngologist proves otherwise.

"The removal of the tonsils when diseased adds materially to the welfare of the patient and does not affect the voice."

The author denies the harmful effects of tobacco.

This book should be of value to anyone interested in the training of the voice.

The publisher is to be congratulated on the high quality of print and paper employed.

H. J. Rothschild, M.D.

JUDGMENT ON BIRTH CONTROL. R. de Guchteneere. Price $2.00. New York: The MacMillan Company, 1931.

This book, written by a Belgian physician, gives a broad view of the entire subject of birth control. It explains Malthusianism and gives the facts concerning that doctrine. Next it takes up Neo-Malthusianism and the various modifications of it which have led to the present widespread Birth Control movement. In the next four chapters the subject of birth control is discussed from the economic, eugenic, medical and moral aspects. Throughout these chapters the judgment against the Birth Control movement is based on scientific reason in support of natural law and demands the consideration of science and common sense without regard to religious teaching.

The remaining fifteen pages show the parallel between these conclusions and the Catholic view of birth, and stress the rôle of religion as opposed to paganistic individualism in bringing the human will into conformity with natural law in the interest of humanity.

Charlotte A. Stickney, M.D.

FOR SALE—To close estate: Completely equipped Minneapolis physician's office, including Fluoroscope, X-ray, Stereoscopic Viewer, Metabolor. Phone number and same space is desired. Cash or reasonable terms. Howard P. Quealy, Administrator, 754 McKnight Building, Minneapolis.

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Counties—Aitkin, Carlton, Cook, Itasca, Kanabec, Koochiching, Lake, Pine, St. Louis.

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*Terms expire December 31, of year indicated.

MINNESOTA STATE MEDICAL ASSOCIATION

COUNTY SOCIETY ROSTER

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month
Annual meeting, last regular meeting of year

President
Butzer, J. A.............Mankato

Secretary
Huffington, H. L.............Mankato

Andrews, J. W.............Mankato
Andrews, R. N.............Mankato
Benham, E. W.............Mankato
Black, William.............Mankato
Butzer, J. A.............Mankato
Cosgriff, J. A.............Olivia
Dahl, G. A.............Mankato
Denman, A. V.............Mankato
Eckstein, A. W.............Mankato
Edwards, Ralph T.............Elysian
Franchere, F. W.............Lake Crystal
Fugina, G. R.............Mankato
Hassett, R. G.............Mankato
Hielscher, J. A.............Mankato
Holbrook, J. S.............Mankato
Howard, M. I.............Mankato
Huffington, H. L.............Mankato
Juliar, R. O.............St. Clair
Kemp, A. F.............Mankato
Liedloff, A. G.............Mankato
Lloyd, H. J.............Mankato
Miller, V. I.............Mankato
Osborn, Lida.............Mankato
Schlesselman, J. T.............Mankato
Schmidt, P. A.............Good Thunder
Sohmer, A. E.............Mankato
Stillwell, W. C.............Mankato
Vezina, J. C.............Mapleton
Wentworth, A. J.............Mankato
Williams, Hugh O.............Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties
Regular meetings, May and October
Annual meeting, October

President
Henderson, A. J.............Kiester

Secretary
Hunt, R. C.............Fairmont

Bailey, H. B.............Fairmont
Blanchard, H. G.............Fairmont
Boysen, H.............Welcome
Butz, J. A.............Monterey
Chambers, W. C.............Blue Earth
Cooper, M. D.............Winnebago City
Durgin, F. L.............Winnebago
Folta, John.............Ceylon
Gardner, V. H.............Fairmont
Heimark, J. J.............Fairmont
Henderson, A. J.............Kiester
Hunt, F. N.............Fairmont
Hunt, R. C.............Fairmont
Hunte, A. F.............Bylos, Arizona
Jacobs, A. C.............Elmore
Johnson, H. P.............Fairmont
Logan, F. W.............Blue Earth
Luedtke, G. H.............Fairmont
McGroarity, J. J.............Easton
Miller, H. A.............Fairmont
Mills, J. L.............Winnebago
Richardson, W. J.............Fairmont
Sommer, A. W.............Elmore
Vaughan, V. M.............Truman
Wilson, C. E.............Blue Earth

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle, Sibley, Renville and Yellow Medicine Counties
Regular meetings, Fourth Thursday of January, April, July, October
Annual Meeting, October

President
Penhall, F. W.............Morton

Secretary
Dordal, J.............Sacred Heart

Adams, R. C.............Bird Island
Bacon, R. S.............Montevideo
Bergh, L. N.............Montevideo
Billings, R. E.............Franklin
Brand, W. A.............Redwood Falls
Burns, M. A.............Milan
Cole, H. B.............Redwood Falls
Cress, E. E.............Boyd
Dordal, J.............Sacred Heart
Flinn, T. E.............Redwood Falls
Flower, W. Z.............Minneapolis
Foshager, H. T.............Clara City
Gaines, E. C.............Buffalo Lake
Hauge, M. I.............Clarkfield
Hauge, M. M.............Clarkfield
Herbert, W. L.............Maynard
Holmberg, L. J.............Canby
Johnson, C. M.............Dawson
Johnson, H. M.............Dawson
Johnson, O. H.............Echo
Jordan, L. S.............Granite Falls
Kilbride, J. S.............Canby
Lee, Walter N.............Madison
Lima, Ludvig.............Montevideo
Mesker, G. H.............Olivia
Mitchell, A. B.............Lansing, Mich.
Nelson, M. S.............Granite Falls
Olson, W. P.............Gaylord
Passer, A. A.............Olivia
Penhall, F. W.............Morton
Roust, H. A.............Montevideo
Smith, L. G.............Montevideo
Stcmsrud, A. A.*.............Dawson
Tangen, G. M.............Canby
Westby, Magnus.............Madison
Westby, Nels.............Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Annual meeting, December

President
Bottolfson, B. T.............Moorhead

Secretary
Heimark, J. H.............Moorhead

Aborn, W. H.............Hawley
Archibald, F. M.............Mahnomen
Bergheim, M. C.............Hawley
Bottolfson, B. T.............Moorhead
Carman, J. E.............Detroit Lakes
Ellingson, A. R.............Detroit Lakes
Gosslee, G. L.............Moorhead
Hagen, O. J.............Moorhead
Heimark, J. H.............Moorhead
Humphrey, E. W.............Moorhead
Larsen, O. O.............Detroit Lakes
Larson, A. L.............Detroit Lakes
Meighen, J. W.............Ulen
Rutledge, L. H.............Detroit Lakes
Simison, C. W.............Hawley
Soine, T. S.............Barnesville
Thornby, H. J.............Moorhead
Thysell, F. A.............Moorhead

DODGE COUNTY MEDICAL SOCIETY

Annual meeting, August

President
Baker, H. R.............Hayfield

Affeldt, D. E.............Kasson
Baker, H. R.............Hayfield

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Isanti, Kanabec, Mille Lacs and Sherburne Counties
Regular meetings, November, May, August
Annual meeting, November

President
Cooney, H. C.............Princeton

Secretary
Schoofs, G. E.............North Branch

Brownstone, Manuel.............Sandstone
Callahan, F. F.............Pokegama
Cooney, H. C.............Princeton
Dredge, H. P.............Sandstone
Ehmke, W. C.............Willow River
Flom, A. O.............Chisago City
Halpin, J. E.............Rush City
Hedenstrom, L. H.............Cambridge
Heseltine, V. G.............Taylors Falls
Holmes, A. E.............Rush City
Kelsey, C. G.............Hinckley
Kooiker, H. J.............Milaca
Nethercott, E. G.............Pine City
Norrgard, H. T.............Milaca
Pearson, W. T.............Finlayson
Peterson, A. A.............Mora
Phelps, A. G.............St. Paul
Roehlke, A. B.............Elk River
Schoofs, G. E.............North Branch
Stephan, E. L.............Hinckley
Stratte, A. K.............Pine City
Swennes, O. S.............Wahkon
Swenson, Charles.............Braham
Truog, C. P.............Lindstrom
Vik, Melvin.............Onamia
Vrooman, F. E.............St. Francis
Zeien, Thomas.............North Branch

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*Deceased.

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, December

President	
Palmer, W. L.	Albert Lea
Secretary	
Freligh, W. P.	Albert Lea
Branham, D. S.	Albert Lea
Burns, H. D.	Albert Lea
Butturff, C. R.	Freeborn
Calhoun, F. W.	Albert Lea
Folken, F. G.	Albert Lea
Freeman, J. P.	Albert Lea
Freligh, W. P.	Albert Lea
Gamble, J. W.	Albert Lea
Gamble, P. M.	Albert Lea
Gamble, R. M.	Albert Lea
Gullixson, A.	Albert Lea
Kaasa, L. J.	Albert Lea
Kamp, B. A.	Albert Lea
Leopard, B. A.	Albert Lea
Manley, L. V.	Albert Lea
Palmer, C. F.	Albert Lea
Palmer, W. L.	Albert Lea
Schultz, J. A.	Albert Lea
Whitson, S. A.	Alden

GOODHUE COUNTY MEDICAL SOCIETY

Annual meeting, December

President	
Williams, M. R.	Cannon Falls
Secretary	
Steffens, L. A.	Red Wing
Aanes, A. M.	Red Wing
Anderson, S. H.	Red Wing
Brusegard, J. F.	Red Wing
Claydon, D. R.	Red Wing
Claydon, L. E.	Red Wing
Cremer, M. H.	Red Wing
Fortney, G. O.	Zumbrota
Johnson, A. E.	Red Wing
Jones, A. W.	Red Wing
Liffrig, W. W.	Goodhue
McGuigan, H. T.	Red Wing
Peterson, J. A.	Red Wing
Smith, M. W.	Red Wing
Steffens, L. A.	Red Wing
Vaaler, T.	Cannon Falls
Williams, M. R.	Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday of each month
Annual meeting, October

President	
Barron, Moses	Minneapolis
Secretary	
Hansen, Erling W.	Minneapolis
Alexander, H. A.	Minneapolis
Aling, C. P.	Minneapolis
Allen, H. W.	Minneapolis
Allison, R. G.	Minneapolis
Almquist, H. E.	Minneapolis
Altnow, H. O.	Minneapolis
Andersen, A. G.	Minneapolis
Andersen, S. C.	Minneapolis
Anderson, Arnold S.	St. Paul
Anderson, D. D.	Minneapolis
Anderson, Edward D.	Minneapolis
Anderson, Ernest R.	Minneapolis
Anderson, F. J.	Minneapolis
Anderson, J. K.	Minneapolis
Anderson, K. W.	Minneapolis
Anderson, Phillip A.	Minneapolis
Anderson, W. S.	Minneapolis
Andreassen, E. C.	Minneapolis
Annis, H. B.	Minneapolis
Arey, H. C.	Excelsior
Arvidson, C. G.	Minneapolis
Aune, Martin	Minneapolis
Aurand, W. H.	Minneapolis
Avery, J. F.	Minneapolis
Baken, M. P.	Minneapolis
Baker, A. T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, Looe	Minneapolis
Barber, J. P.	Minneapolis
Barron, Moses	Minneapolis
Bass, G. W.	Minneapolis
Baxter, S. H.	Minneapolis
Bayard, H. F.	Minneapolis
Beard, A. H.	Minneapolis
Beard, R. O.	Minneapolis
Bedford, E. W.	Minneapolis
Bell, E. T.	Minneapolis
Bell, J. W.	Minneapolis
Benedict, E. E.	Minneapolis
Benjamin, A. E.	Minneapolis
Benn, F. G.	Minneapolis
Berkwitz, N. J.	Minneapolis
Bessesen, A. N., Sr.	Minneapolis
Bessesen, A. N., Jr.	Minneapolis
Bessesen, W. A.	Minneapolis
Blake, James	Hopkins
Blaustone, H. H.	Minneapolis
Blumenthal, Jacob	Minneapolis
Bockman, M. W. H.	Minneapolis
Boies, L. R.	Minneapolis
Booth, A. E.	Minneapolis
Boreen, C. A.	Minneapolis
Borgeson, E. J.	Minneapolis
Bouman, H. A.	Minneapolis
Boynton, Ruth	Minneapolis
Bracken, H. M.	Minneapolis
Bratrud, A. F.	Minneapolis
Brown, E. D.	Minneapolis
Brown, Edward J.	Minneapolis
Bryant, O. R.	Minneapolis
Bulkley, Kenneth	Minneapolis
Bullard, Mattie J.	Minneapolis
Butler, John	Minneapolis
Buzzelle, L. K.	Minneapolis
Cable, Morris L.	Minneapolis
Cabot, G. S.	Minneapolis
Cabot, V. S.	Minneapolis
Cady, L. H.	Minneapolis
Callerstrom, G. W.	Minneapolis
Cameron, Isabell	Minneapolis
Camp, W. E.	Minneapolis
Campbell, L. M.	Minneapolis
Campbell, O. J.	Minneapolis
Campbell, R. A.	Minneapolis
Cardle, A. E.	Minneapolis
Carey, J. B.	Minneapolis
Carlaw, C. M.	Minneapolis
Carlson, Lawrence	Minneapolis
Caron, R. P.	Minneapolis
Cavanor, F. T.	Minneapolis
Chamberlain, H. E.	Minneapoils
Cheleen, S. J.	Minneapolis
Cherry, C. H.	Minneapolis
Chesley, A. J.	Minneapolis
Clark, H. S.	Minneapolis
Cohen, S. S.	Oak Terrace
Condit, W. H.	Minneapolis
Cook, H. W.	Minneapolis
Cooperman, H. O.	Minneapolis
Corbett, J. F.	Minneapolis
Corniea, A. D.	Minneapolis
Cosman, E. O.	Minneapolis
Crafts, L. M.	Minneapolis
Cranmer, R. R.	Minneapolis
Cranston, R. W.	St. Louis Park
Creighton, R. H.	Minneapolis
Curtin, J. F.	Minneapolis
Cutts, George	Minneapolis
Dady, E. E.	Minneapolis
Dahl, E. O.	Minneapolis
Dahl. J. A.	Minneapolis
Dahlstrom, A. W.	Minneapolis
Daniel, D. H.	Minneapolis
Daniel, L. M.	Minneapolis
Dart, L. O.	Minneapolis
Devereaux, T. J.	Wayzata
Dewar, J. E.	Minneapolis
Deziel, G.	Minneapolis
Diehl, H. S.	Minneapolis
Diessner, H. D.	Minneapolis
Donaldson, C. A.	Mesa, Arizona
Dorge, R. I.	Minneapolis
Dornblaser, H. B.	Minneapolis
Dorsey, G. C.	Minneapolis
Doxey, G. L.	Minneapolis
Doyle, L. O.	Minneapolis
Drake, C. R.	Minneapolis
Dreisbach, N.	Minneapolis
Duff, E. R.	Minneapolis
Dunlap, E. H.	Minneapolis
Dunn, G. R.	Minneapolis
Duryea, Marbry	Minneapolis
Dutton, C. E.	Minneapolis
Dworsky, S. D.	Minneapolis
Egilsrud, Kristian	Minneapolis
Ehrenberg, C. J.	Minneapolis
Ehrlich, S. Paul	Minneapolis
Eitel, G. D.	Minneapolis
Ellison, D. E.	Minneapolis
Emond, A. J.	Minneapolis
Erb, F. A.	Minneapolis
Erdmann, C. A.	Minneapolis
Erickson, R. F.	Minneapolis
Ericson, J. G.	Minneapolis
Ericson, R. M.	Minneapolis
Evans, E. T.	Minneapolis
Evans, R. D.	Minneapolis
Everlof, J. L.	Minneapolis
Exley, E. W. F.	Minneapolis
Fahr, Geo. E.	Minneapolis
Fansler, W. A.	Minneapolis
Farr, R. E.	Hopkins
Feeney, J. M.	Minneapolis
Fenger, F.	Oak Terrace
Fetterly, Warren	Minneapolis
Fink, L. W.	Minneapolis
Fink, W. H.	Minneapolis
Fitzgerald, D. F.	Minneapolis
Fjeldstad, C. Alford	Minneapolis
Flagstad, Albert E.*	Minneapolis
Fowler, L. H.	Minneapolis
Fox, John M.	Minneapolis
Fredericks, G. M.	Minneapolis
Friedell, A.	Minneapolis
Funk, V. K.	Oak Terrace
Gammell, J. H.	Minneapolis
Gardner, E. L.	Minneapolis
Geist, E. S.	Minneapolis
Giere, E. O.	Minneapolis
Giere, J. C.	Minneapolis
Giere, R. W.	Benson
Giessler, Paul W.	Minneapolis
Gilles, F. L.	Minneapolis
Ginsberg, Harry	Minneapolis
Goldberg, I. [illegible]	Minneapolis
Gratzek, F. R.	Minneapolis
Graves, Floyd	Minneapolis
Green, E. K.	Minneapolis
Greene, W. P.	Minneapolis
Greisheimer, Esther M.	Minneapolis
Grimes, Marian	Minneapolis
Gronvall, Paul R.	Minneapolis
Gunderson, Nels A.	Minneapolis
Gustafson, H. T.	Minneapolis
Hacking, F. H.	Minneapolis
Haddow, N. W.	Minneapolis
Hagen, G. L.	Minneapolis
Haggard, G. D.	Minneapolis
Hall, J. M.	Minneapolis
Hall, S. S.	Minneapolis
Hallberg, C. A.	Minneapolis
Hamel, A. L.	Minneapolis
Hamilton, A. S.	Minneapolis
Hamlin, G. B.	Minneapolis
Hammond, A. J.	Minneapolis
Hannah, H. B.	Minneapolis
Hansen, C. O.	Minneapolis
Hansen, Erling W.	Minneapolis
Hansen, Olga S.,	Minneapolis
Hanson, H. James	Minneapolis
Hanson, H. V.	St. Paul
Hanson, W. A.	Minneapolis
Hare, E. R.	Minneapolis
Harrington, C. D.	Minneapolis
Harrington, F. E.	Minneapolis
Hartzell, T. B.	Minneapolis
Hastings, D. R.	Minneapolis
Haverfield, Addie R.	Minneapolis
Hawkinson, R. P.	Minneapolis
Hayes, J. M.	Minneapolis
Head, Douglas P.	Minneapolis
Head, G. D.	Minneapolis
Hearn, W. O.	Minneapolis
Hedback, A. E.	Minneapolis
Heim, R. R.	Minneapolis
Helk, H. H.	Minneapolis
Hendrickson, J. F.	Minneapolis

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*Deceased.

Henry, C. E.	Minneapolis
Henry, M. O.	Minneapolis
Herbolsheimer, A. J.	Minneapolis
Herbst, W. P.	Minneapolis
Herman, A. L.	Minneapolis
Hiebert, J. P.	Minneapolis
Higbee, P. A.	Minneapolis
Higgins, J. H.	Minneapolis
Hill, Eleanor J.	Minneapolis
Hirschfelder, A. D.	Minneapolis
Hirschfield, Adolph	Minneapolis
Hirshfield, F. R.	Minneapolis
Hoaglund, A. W.	Minneapolis
Hobbs, C. A.	Minneapolis
Hodge, S. V.	Minneapolis
Holland, A. S.	Minneapolis
Holen, T.*	Minneapolis
Holl, P. M.	Minneapolis
Holt, W. B.	Minneapolis
Howard, W. H.	Minneapolis
Huenekens, E. J.	Minneapolis
Hughes, L. D.	Minneapolis
Hultkrans, R. E.	Minneapolis
Hurd, Annah	Minneapolis
Hutchinson, C. J.	Minneapolis
Hymes, Charles	Minneapolis
Hynes, James	Minneapolis
Hynes, J. E.	Minneapolis
Irvine, H. G.	Minneapolis
Irwin, A. F.	Minneapolis
Jackson, C. M.	Minneapolis
Jennings, F. L.	Oak Terrace
Jennings, Mary H.	Minneapolis
Jensen, Harry	Minneapolis
Jensen, M. J.	Minneapolis
Johnson, A. E.	Minneapolis
Johnson, Arthur B.	Minneapolis
Johnson, James A.	Minneapolis
Johnson, Julius	Minneapolis
Johnson, Nimrod A.	Minneapolis
Johnson, Norman	Minneapolis
Johnson, R. A.	Minneapolis
Johnson, Selmar M.	Minneapolis
Johnson, Youbert T.	Minneapolis
Jones, G. M.	Minneapolis
Jones, H. W.	Minneapolis
Josewich, Alexander	Minneapolis
Kelby, G. M.	Minneapolis
Kennedy, C. C.	Minneapolis
Kennedy, Jane F.	Minneapolis
Kennedy, R. Roy	Minneapolis
Kibbe, O. A.	Minneapolis
King, E. A.	Minneapolis
King, Harry T.	Minneapolis
King, W. R.	Minneapolis
Kinsella, T. J.	Oak Terrace
Kistler, A. J.	Minneapolis
Kistler, C. M.	Minneapolis
Knight, R. R.	Minneapolis
Knight, R. T.	Minneapolis
Koch, J. C.	Minneapolis
Koepcke, G. M.	Minneapolis
Koller, H. M.	Minneapolis
Koller, L. R.	Minneapolis
Kremer, Walter J.	Minneapolis
Kriedt, Daniel	Minneapolis
Kucera, F. J.	Hopkins
Kucera, W. J.	Minneapolis
Lajoie, J. M.	Minneapolis
Lapierre, A. P.	Minneapolis
Lapierre, C. A.	Minneapolis
Lapierre, J. T.	Minneapolis
Larson, C. M.	Minneapolis
Laurent, A. A.	Minneapolis
La Vake, R. T.	Minneapolis
Lazar, H. L.	Minneapolis
Leavitt, H. H.	Minneapolis
Lebowske, J. A.	Minneapolis
Lee, H. M.	Minneapolis
Lee, T. G.	Minneapolis
Leggett, Elizabeth A.	Minneapolis
Leland, H. R.	Minneapolis
Leland, M. N.	Minneapolis
Leonard, L. J.	Minneapolis
Levine, N. M.	Minneapolis
Lillehei, E. J.	Minneapolis
Lind, C. J.	Minneapolis
Lindquist, R. H.	Minneapolis
Linner, H. P.	Minneapolis
Linton, W. B.	Minneapolis
Litman, A. B.	Minneapolis
Litzenberg, J. C.	Minneapolis
Logefeil, R. C.	Minneapolis
Long, Jesse	Minneapolis
Loomis, E. A.	Minneapolis
Lundgren, A. C.	Minneapolis
Lundquist, E. F.	Minneapolis
Lynch, M. J.	Minneapolis
Lyon, E. P.	Minneapolis
Lyon, J. D.	Minneapolis
Lysne, Henry	Minneapolis
McCarthy, Donald	Minneapolis
McCartney, J. S.	Minneapolis
McDaniel, Orianna	Minneapolis
McEachran, A.	Minneapolis
McFarland, A. H.	Minneapolis
McGandy, R. F.	Minneapolis
McGeary, G. E.	Minneapolis
McIntyre, George	Minneapolis
McKinlay, C. A.	Minneapolis
McKinley, J. C.	Minneapolis
McKinney, F. S.	Minneapolis
McPheeters, H. O.	Minneapolis
MacDonald, A. E.	Minneapolis
MacDonald, D. A.	Minneapolis
MacDonald, I. C.	Minneapolis
Mach, Frank B.	Minneapolis
Macnie, J. S.	Minneapolis
Magiera, Estelle A.	Minneapolis
Maland, C. O.	Minneapolis
Mann, A. T.	Minneapolis
Marcley, W. J.	Minneapolis
Mariette, E. S.	Oak Terrace
Mark, D. B.	Minneapolis
Martinson, C. J.	Wayzata
Matchan, G. R.	Minneapolis
Matthews, Justus	Minneapolis
Mattill, P. M.	Oak Terrace
Maxeiner, S. R.	Minneapolis
May, W. H.	Minneapolis
Merkert, C. E.	Minneapolis
Merkert, G. L.	Minneapolis
Meyer, E. L.	Minneapolis
Michael, J. C.	Minneapolis
Michelson, H. E.	Minneapolis
Milton, J. S.	Minneapolis
Moen, J. K., Jr.	Minneapolis
Moir, W. W.	Minneapolis
Moorhead, M. B.	Minneapolis
Moren, Edwin	Minneapolis
Moriarty, Cecile R.	Minneapolis
Morrison, A. W.	Minneapolis
Murphy, Ignatius J.	Minneapolis
Myers, J. A.	Minneapolis
Nathanson, M. H.	Minneapolis
Nelson, C. P.	Minneapolis
Nelson, Harvey	Minneapolis
Nelson, H. S.	Minneapolis
Nelson, O. E.	Minneapolis
Newhart, Horace	Minneapolis
Nordin, G. T.	Minneapolis
Nordland, Martin	Minneapolis
Noth, H. W.	Minneapolis
Nystrom, Ruth	Minneapolis
Oberg, C. M.	Minneapolis
O'Brien, W. A.	Minneapolis
O'Donnell, J. E.	Minneapolis
Olson, F. A.	Minneapolis
Olson, Olaf A.	Minneapolis
Olson, R. G.	Minneapolis
Owre, Oscar	Minneapolis
Parks, A. H.	Minneapolis
Patterson, W. E.	Minneapolis
Paulsen, E. L.	Minneapolis
Pearce, N. O.	Minneapolis
Pederson, Harold	Minneapolis
Pederson, R. M.	Minneapolis
Peppard, T. A.	Minneapolis
Perry, R. St. J.	Minneapolis
Petersen, J. R.	Minneapolis
Petersen, Thorvald	Minneapolis
Peterson, H. W.	Minneapolis
Peterson, O. H.	Minneapolis
Peterson, W. C.	Minneapolis
Petit, L. J.	Minneapolis
Pettit, C. W.	Minneapolis
Pfunder, M. C.	Minneapolis
Phelps, K. A.	Minneapolis
Platou, E. S.	Minneapolis
Pollard D. W.	Minneapolis
Poppe, F. H.	Minneapolis
Pratt, F. J.	Minneapolis
Pratt, J. A.	Minneapolis
Preine, I. A.	Minneapolis
Prim, J. A.	Minneapolis
Proshek, C. E.	Minneapolis
Quinby, T. F.	Minneapolis
Quist, H. W.	Minneapolis
Reed, C. A.	Minneapolis
Rees, S. P.*	Minneapolis
Regnier, E. A.	Minneapolis
Reynolds, J. S.	Minneapolis
Richardson, F. S.	Minneapolis
Richdorf, L. F.	Minneapolis
Ridgway, Florence	Minneapolis
Rigler, L. G.	St. Paul
Rishmiller, J. H.	Minneapolis
Rizer, R. I.	Minneapolis
Roan, C. M.	Minneapolis
Robb, E. F.	Minneapolis
Roberts, T. S.	Minneapolis
Roberts, W. B.	Minneapolis
Robitshek, E. C.	Minneapolis
Rochford, W. E.	Minneapolis
Rodda, F. C.	Minneapolis
Rodgers, C. L.	Minneapolis
Rosen, S.	Minneapolis
Rosenwald, R. M.	Minneapolis
Rowe, W. H.	Minneapolis
Rucker, C. W.	Minneapolis
Rucker, W. H.	Minneapolis
Rud, N. E.	Minneapolis
Rudell, G. L.	Minneapolis
Russeth, A. N.	Minneapolis
Sadler, W. P.	Minneapolis
St. Cyr, K. J.	Osseo
Salt, C. G.	Minneapolis
Sawatzky, W. A.	Minneapolis
Schaaf, F. H. K.	Minneapolis
Schaefer, W. G.	Minneapolis
Scheldrup, N. H.	Minneapolis
Schlesselman, George	Anoka
Schmidt, G. F.	Minneapolis
Schmitt, A. F.	Minneapolis
Schmitt, S. C.	Minneapolis
Schottler, M. E.	Minneapolis
Schussler, O. F.	Minneapolis
Schwartz, V. J.	Minneapolis
Schwyzer, Gustav	Minneapolis
Schwyzer, R.	Minneapolis
Scott, F. H.	Minneapolis
Seaberg, J. A.	Minneapolis
Seashore, Gilbert	Minneapolis
Seham, Max	Minneapolis
Selleseth, Iver	Minneapolis
Sessions, J. C.	Minneapolis
Shapiro, M. J.	Minneapolis
Simons, Jalmar	Minneapolis
Simpson, E. D.	Minneapolis
Simpson, J. D.*	Minneapolis
Siperstein, D. M.	Minneapolis
Sitar, R. F.	Minneapolis
Sivertsen, Ivar	Minneapolis
Slocumb, Maude S.	Minneapolis
Smith, A. M.	Minneapolis
Smith, Arthur E.	Minneapolis
Smith, H. R.	Minneapolis
Smith, N. M.	Minneapolis
Soderlind, R. T.	Minneapolis
Solhaug, S. B.	Minneapolis
Spratt, C. N.	Minneapolis
Stelter, L. A.	Minneapolis
Stenstrom, Annette T.	Minneapolis
Stewart, C. A.	Minneapolis
Stewart, R. I.	Minneapolis
Stomel, Joseph	Minneapolis
Strachauer, A. C.	Minneapolis
Strout, E. S.	Minneapolis
Sturre, J. R.	Minneapolis
Sundt, M.	Minneapolis
Swanson, Ceph	Minneapolis
Swanson, R. E	Minneapolis
Sweetser, H. B., Sr.	Minneapolis
Sweetser, H. B., Jr.	Minneapolis
Sweetser, Theodore	Minneapolis
Sweitzer, S. E.	Minneapolis
Swendseen, C. G.	Minneapolis
Taft, John O.	Minneapolis
Tanner, A. C.	Minneapolis
Taylor, Rood	Minneapolis
Ternstrom, O. H.	Minneapolis
Thomas, George E.	Minneapolis
Thomas, George H.	Minneapolis
Thomas, Gilbert J.	Minneapolis
Thompson, H. H.	Minneapolis
Tingdale, A. C.	Minneapolis
Trueman, H. S.	Minneapolis
Tunstead, H. J.	Minneapolis
Turnacliff, D. D.	Minneapolis
Tyrrell, C. C.	Minneapolis
Ude, W H.	Minneapolis
Ulrich, L.	Minneapolis
Undine. A.	Minneapolis
Urner, . A.	Minneapolis
Vik, A. E.	Minneapolis
Vogtel, M. A.	Minneapolis
Voyer, E. O.	Minneapolis
Wahlquist, H. F.	Minneapolis
Waldron, C. W.	Minneapolis
Wall, C. R.	Minneapolis
Wangensteen, O. H.	Minneapolis
Wanous, E. Z.	Minneapolis
Ward, A. W.	Minneapolis
Ward, P. A.	Minneapolis
Warham, T. T.	Minneapolis
Watson, J. A.	Minneapolis
Webb, R. C.	Minneapolis
Weisman, S. A.	Minneapolis
Welles, H. J.	Minneapolis
Wethall, A. G.	Minneapolis
Wetherby, Macnider	Minneapolis
Weum, T. W.	Minneapolis
White, S. Marx	Minneapolis

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*Deceased.

White, Willard D.	Minneapolis
Widen, W. F.	Minneapolis
Wiese, H. F. B.	Minneapolis
Wilcox, A. E.	Minneapolis
Wilder, R. L.	Minneapolis
Wilken, P. A.	Minneapolis
Wilkerson, V. A.	Minneapolis
Willcutt, Clarence	Minneapolis
Williams, H. L.*	Minneapolis
Williams, Robert	Minneapolis
Winther, Nora M. C.	Minneapolis
Witham, C. A.	Minneapolis
Wittich, F. W.	Minneapolis
Wohlrabe, A. A.	Minneapolis
Wood, D. F.	Minneapolis
Woodworth, Elizabeth	Minneapolis
Wright, C. B.	Minneapolis
Wright, C. D.	Minneapolis
Wright, F. R.	Minneapolis
Wynne, H. M. N.	Minneapolis
Yoerg, O. W.	Minneapolis
Zanger, Isabelle M.	Minneapolis
Zaworski, E. A.	Minneapolis
Zierold, A. A.	Minneapolis

HOUSTON-FILLMORE COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, October

President	
Anderson, N. E.	Harmony
Secretary	
Helland, J. W.	Spring Grove
Anderson, N. E.	Harmony
Beiswanger, R. H.	Wykoff
Belote, G. B.	Caledonia
Brekke, H. J.	Caledonia
Canfield, W. W.	Houston
Davis, I. Grant	Rushford
Drake, F. A.	Lanesboro
Eby, C. B.	Spring Valley
Edward, George	Canton
Grinnell, W. B.	Preston
Helland, G. M.	Spring Grove
Helland, J. W.	Spring Grove
Lannin, J. C.	Mabel
Nass, H. A.	Mabel
Nehring, J. P.	Preston
Onsgard, L. K., Jr.	Houston
Onsgard, L. K., Sr.	Houston
Palmer, R. N.*	Lanesboro
Tierney, C. M.	Harmony
Williams, R. V.	Rushford
Woodruff, C. W.	Chatfield

KANDIYOHI-SWIFT COUNTY MEDICAL SOCIETY

Regular meetings, monthly at call
Annual meeting, December

President	
Kaufman, Wm. C.	Appleton
Secretary	
Scofield, C. L.	Benson
Anderson, R. E.	Willmar
Arnson, J. M.	Benson
Behmler, F. W.	Appleton
Branton, A. F.	Willmar
Branton, B. J.	Willmar
Daignault, Oscar	Benson
Dowswell, W. J.	Kerkhoven
Fiksdal, M. J.	Willmar
Frisch, F. P.	Willmar
Frost, E. H.	Willmar
Giere, S. W.	Benson
Hodapp, R. J.	Willmar
Hutchinson, Henry	New London
Jacobs, J. C.	Willmar
Jensen, H. H.	Atwater
Kaufman, W. C.	Appleton
Rains, J. M.	Willmar
Scofield, C. L.	Benson
Smith, B. F.	Willmar
Thompson, Arthur	Raymond

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month
Annual meeting, October

President	
Golden, C. M.	Tyler
Secretary	
Workman, H. M.	Tracy
Bossingham, O. N.	Lake Benton
Ford, B. C.	Marshall
Germo, Chas.	Balaton
Golden, C. M.	Tyler
Gray, F. D.	Marshall
Happe, L. J.	Marshall
Hermanson, P. E.	Hendricks
Hoidale, A. D.	Tracy
Jacquot, G. L.	Marshall
Olson, Archibald	Hendricks
Persons, C. E.	Marshall
Robertson, J. B.	Cottonwood
Sanderson, E. T.	Minneota
Thordarson, Theo.	Minneota
Vadheim, A. L.	Tyler
Valentine, W. H.	Tracy
Workman, H. M.	Tracy
Workman, W. G.	Tracy
Yaeger, W. W.	Ivanhoe

McLEOD COUNTY MEDICAL SOCIETY

Annual meeting, January

President	
Trutna, Thos. J.	Silver Lake
Secretary	
Jensen, A. H.	Hutchinson
Clement, J. B.	Lester Prairie
Holm, H. H.	Glencoe
Jensen, A. H.	Hutchinson
Klima, W. W.	Stewart
Langhoff, A. H.	Glencoe
Ninneman, N. N.	Silver Lake
Sahr, W. G.	Hutchinson
Sheppard, Fred	Hutchinson
Sheppard, P. E.	Hutchinson
Trutna, Thos. J.	Silver Lake

MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, May, August, October
Annual meeting, December

President	
Dulude, S. S.	Dassel
Secretary	
Danielson, K. A.	Litchfield
Brigham, Frank	Watkins
Danielson, K. A.	Litchfield
Dulude, S. S.	Dassel
Edwards, G. C.	GroveCity
Macklin, W. E., Jr.	Litchfield
O'Connor, D. C.	Eden Valley
Robertson, A. W.*	Litchfield
Telford, V. J.	Litchfield
Wilmot, H. E.	Litchfield

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of month
Annual meeting, December

President	
Lommen, P. A.	Austin
Secretary	
Sheedy, C. L.	Austin
Allen, A. W.	Austin
Allen, C. C.	Austin
Cobb, W. F.	Lyle
Coleman, F. B.	Austin
Cronwell, B. J.	Austin
Ewbank, J. N.	Minneapolis
Greene, H. H.	Austin
Grise, W. B.	Austin
Havens, J. G. W.	Austin
Hegge, O. H.	Austin
Hegge, R. S.	Austin
Henslin, A. E.	LeRoy
Hertel, G. E.	Austin
Leck, C. C.	Austin
Lommen, P. A.	Austin
McKenna, J. K.	Austin
Melzer, G. R.	Lyle
Mitchell, R. S.	Grand Meadow
Morrow, J. J.	Austin
Morse, M. P.	LeRoy
Rebman, E. C.	Austin
Robertson, P. A.	Austin
Sheedy, C. L.	Austin

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*Deceased.

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, March, June, September, December
Annual meeting, December

President

Traxler, F. J	Henderson

Secretary

Daniels, J. W	St. Peter

Aitkens, H. B	Le Center
Covell, W. W	St. Peter
Daniels, J. W	St. Peter
Dodge, F. A	Le Sueur
Ericson, Swan	Le Sueur
Freeman, G. H	St. Peter
Gully, R. J	St. Peter
Hiniker, P. J	Le Sueur
Holtan, Theodore	Waterville
Kerschbaumer, Louisa	St. Peter
Lenander, M. E	St. Peter
McKechnie, Wilfred	St. Peter
McKeon, J. O	Montgomery
Peterson, M. C	St. Peter
Strathern, F. P	St. Peter
Traxler, F. J	Henderson
Wolner, Oscar H	St. Peter

OLMSTED COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, first Tuesday in November

President

Hartman, H. R	Rochester

Secretary

Piper, M. C	Rochester

Adson, A. W	Rochester
Alderson, L. R	Rochester
Allan, F. N	Rochester
Allen, E. V	Rochester
Allen, R. B	Rochester
Allen, R. W	Rochester
Allen, W. A	Rochester
Alvarez, W. C	Rochester
Amberg, Samuel	Rochester
Anderson, C. M	Rochester
Anderson, M. J	Rochester
Atkinson, Walter	Rochester
Balfour, D. C	Rochester
Ball, R. G	Rochester
Bannick, E. G	Rochester
Barber, K. W	Rochester
Barborka, C. J	Rochester
Bargen, J. A	Rochester
Barker, N. W	Rochester
Barnes, A. R	Rochester
Bartels, E. C	Rochester
Benedict, W. L	Rochester
Bennett, R. J., Jr	Rochester
Berger, E. H	Rochester
Berkman, D. M	Rochester
Berkman, J. M	Rochester
Binger, M. W	Rochester
Boothby, W. M	Rochester
Boudry, M. O	Rochester
Bowing, H. H	Rochester
Braasch, W. F	Rochester
Brav, E. A	Rochester
Broders, A. C	Rochester
Brown, A. E	Rochester
Brown, G. E	Rochester
Brown, P. W	Rochester
Brown, R. W	Rochester
Brunsting, L. A	Rochester
Buie, L. A	Rochester
Bumpus, H. C	Rochester
Burke, C. F	Rochester
Burkley, G. G	Rochester
Cabot, C. M	Rochester
Cabot, Hugh	Rochester
Cain, Edmund F	Rochester
Caldwell, J. M., Jr	Rochester
Cameron, M. C., Jr	Rochester
Camp, J. D	Rochester
Castleton, K. B	Rochester
Chapman, C. B	Rochester
Christensen, E. E	Rochester
Christianson, H. W	Rochester
Church, G. T	Rochester
Cilley, E. I. L	Rochester
Collins, D. C	Rochester
Comfort, M. W	Rochester
Conner, H. M	Rochester
Cook, E. N	Rochester
Costello, R. T	Rochester
Counseller, V. S	Rochester
Cox, F. W	Rochester
Craddock, W. H	Rochester
Craig, W. McK	Rochester
Crenshaw, J. L	Rochester
Crewe, J. E	Rochester
Crisp, N. W	Rochester
Curry, F. S	Rochester
Cutts, R. E	Rochester
Daniels, L. E	Rochester
Davis, A. C	Rochester
De Carle, D. W	Rochester
Decker, F. H	Rochester
Desjardins, A. U	Rochester
Dixon, C. F	Rochester
Dixon, R. K	Rochester
Dolder, F. C	Eyota
Donald, J. M	Rochester
Down, H. I	Rochester
Drips, D. G	Rochester
Droegemueller, E. H	Rochester
Dukelow, D. A	St. Charles
Dunlap, H. F	Rochester
Dunlop, J. G., Jr	Rochester
Emmett, J. L	Rochester
Emmons, W. F	Rochester
Eusterman, G. B	Rochester
Evans, V. L	Rochester
Evarts, A. B	Rochester
Faust, L. S	Rochester
Fauster, J. U., Jr	Rochester
Fawcett, C. E	Stewartville
Figi, F. A	Rochester
Finney, W. P., Jr	Rochester
Foor, C. G	Rochester
Ford, Frances A	Rochester
Fortin, H. J	Rochester
Fricke, R. E	Rochester
Fulcher, O. H	Rochester
Gaarde, F. W	Rochester
Ghormley, R. K	Rochester
Gibson, G. G	Rochester
Giffin, H. Z	Rochester
Gillespie, J. B	Rochester
Goeckerman, W. H	Rochester
Goldberg, S. L	Rochester
Graham, A. S	Rochester
Gray, H. K	Rochester
Greene, C. H	Rochester
Grimes, A. E., Jr	Rochester
Habein, H. C	Rochester
Haines, S. F	Rochester
Hale, D. E	Rochester
Hallenbeck, D. F	Rochester
Harmeier, J. W	Rochester
Harper, F. R	Rochester
Harrington, S. W	Rochester
Harris, M. T	Rochester
Harrison, P. W	Rochester
Hartman, H. R	Rochester
Havens, F. Z	Rochester
Hazen, S. F	Rochester
Heazlett, W. A	Rochester
Hebert, W. H. J	Rochester
Heck, F. J	Rochester
Helmholz, H. F	Rochester
Hempstead, B. E	Rochester
Hench, P. S	Rochester
Henderson, M. S	Rochester
Hewitt, Edith S	Rochester
Heyerdale, O. C	Rochester
Hilding, A. C	Rochester
Hiltom, J. M	Rochester
Hines, E. A., Jr	Rochester
Hoerner, M. T	Rochester
Horton, B. T	Rochester
Howell, W. L	Rochester
Hurt, Holcombe H	Rochester
Hyde, T. L	Rochester
Iber, F. C	Rochester
Imes, P. R	Rochester
Johnson, Ellsworth	Rochester
Johnson, H. W. E	Rochester
Johnson, W. R	Rochester
Joyce, G. L	Stewartville
Joyce, G. T	Rochester
Judd, E. S	Rochester
Kegaries, D. L	Rochester
Keith, H. M	Rochester
Keith, N. M	Rochester
Kellum, E. L	Rochester
Kennedy, R. L. J	Rochester
Kepler, E. J	Rochester
Kernohan, J. W	Rochester
Kilbourne, A. F	Rochester
Kirklin, B. R	Rochester
Kirklin, O. L	Rochester
Koelsche, G. A	Rochester
Kullman, H. J	Rochester
Larson, L. M	Rochester
Larson, Paul N	Rochester
Learmonth, J. R	Rochester
Leddy, E. T	Rochester
Lemon, W. S	Rochester
Lendrum, F. C	Rochester
Lester, G. L	Rochester
Leven, N. L	Rochester
Lillie, H. I	Rochester
Lillie, W. I	Rochester
Lochead, D. C	Rochester
Logan, A. H	Rochester
Loney, W. R. R	Rochester
Love, J. G	Rochester
Luden, Georgine	Victoria, B. C., Can.
Lundy, J. S	Rochester
McCarty, W. C	Rochester
McCaughan, J. M	Rochester
McCuskey, C. F	Rochester
McKaig, C. B	Pine Island
McQuiston, J. S	Rochester
Magath, T. B	Rochester
Magee, H. R	Rochester
Major, S. G	Rochester
Mann, F. C	Rochester
Martin, W. J., Jr	Rochester
Massey, B. D	Rochester
Masson, D. M	Rochester
Masson, J. C	Rochester
Mayo, C. H	Rochester
Mayo, C. W	Rochester
Mayo, J. G	Rochester
Mayo, W. J	Rochester
Maytum, C. K	Rochester
Meade, J. R	Rochester
Meland, E. L	Rochester
Mercer, S. R	Rochester
Messick, J. M	Rochester
Meyerding, H. W	Rochester
Michie, T. C	Rochester
Millet, R. F	Rochester
Mills, S. D	Rochester
Moench, L. Mary	Rochester
Moersch, F. P	Rochester
Moersch, H. J	Rochester
Mohardt, J. H	Rochester
Montgomery, Jimmie Ethel	Rochester
Montgomery, Hamilton	Rochester
Morey, J. B	Rochester
Morgan, S. F	Rochester
Morton, S. A	Milwaukee, Wis.
Mroz, R. J	Rochester
Mueller, S. C	Rochester
Murray, S. E	Rochester
Mussey, R. D	Rochester
Nelson, W. L	Rochester
New, G. B	Rochester
Offutt, Susan R	Rochester
Ohlinger, L. B	Chicago, Ill.
O'Leary, P. A	Rochester
Olson, E. A	Pine Island
Overton, L. M	Rochester
Parker, H. L	Rochester
Patmos, Martin	Rochester
Pattee, G. L	Rochester
Pemberton, J. de J	Rochester
Peterson, V. L	Rochester
Phillips, J. R	Rochester
Piper, M. C	Rochester
Plummer, H. S	Rochester
Plummer, W. A	Rochester
Pollock, L. W	Rochester
Popp, W. C	Rochester
Prangen, A. D	Rochester
Prickman, L. E	Rochester
Priestley, J. B	Rochester
Priestley, J. T	Rochester
Quade, R. H	Rochester
Randall, L. M	Rochester
Rankin, F. W	Rochester
Rentschler, E. B	Rochester
Rieniets, J. H	Rochester
Rivers, A. B	Rochester
Rixford, E. L	Rochester
Robertson, H. E	Rochester
Robins, C. R., Jr	Rochester
Robinson, L. W	Rochester

Rogin, J. R.	Rochester
Rosenow, E. C.	Rochester
Rowntree, L. G.	Rochester
Ruffin, Willcox	Rochester
Rynearson, E. H.	Rochester
Sanford, A. H.	Rochester
Scherer, L. R.	Rochester
Scherer, R. G.	Rochester
Serrurier, L. R.	Rochester
Shane, J. H.	Rochester
Sheldon, W. D.	Rochester
Slocumb, C. H.	Rochester
Smith, F. L.	Rochester
Smith, H. L.	Rochester
Smith, N. D.	Rochester
Snell, A. M.	Rochester
Spooner, A. D.	Rochester
Sprague, P. H.	Rochester
Stacy, L. J.	Rochester
Stafne, W. A.	Rochester
Stark, W. B.	Rochester
Starkey, T. A.	Rochester
Stephenson, G. W.	Rochester
Steven, George	Byron
Steward, J. A.	Rochester
Stuck, W. G.	Rochester
Stuhler, L. G.	Rochester
Sutherland, C. G.	Rochester
Sutton, L. F.	Mazeppa
Swart, H. A.	Rochester
Thiessen, N. W.	Rochester
Thompson, G. J.	Rochester
Thornton, H. C.	Rochester
Thorsness, E. T.	Rochester
Tovell, R. M.	Rochester
Tyvand, R. E.	Rochester
Vanzant, Frances R.	Rochester
Vinson, P. P.	Rochester
Voldeng, K. E.	Rochester
Voris, H. C.	Rochester
Wagener, H. P.	Rochester
Wakefield, E. G.	Rochester
Waldron, G. W.	Rochester
Walker, M. A.	Rochester
Waller, L. M.	Rochester
Walters, Waltman	Rochester
Watkins, C. H.	Rochester
Watson, J. R.	Rochester
Weber, H. M.	Rochester
Webster, W. W.	Rochester
Weir, J. F.	Rochester
Wellbrock, W. L. A.	Rochester
Welsh, A. L.	Rochester
Wilbur, D. L.	Rochester
Wilder, R. M.	Rochester
Wilkinsen, E. A.	Rochester
Williams, H. L., Jr.	Rochester
Willius, F. A.	Rochester
Wilson, L. B.	Rochester
Wolff, H. J.	Rochester
Woltman, H. W.	Rochester
Wood, H. G.	Rochester
Zinn, Charles J.	Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Otter Tail, Wilkin, Grant and Douglas Counties
Regular meetings, second Wednesday in January, April, July, October
Annual meeting, second Wednesday in October

President

Kemp, M. W.	Fergus Falls

Secretary

Heiberg, E. A.	Fergus Falls

Baker, A. C.	Fergus Falls
Baker, N. H.	Fergus Falls
Benepe, J. L.	Dent
Boysen, Peter	Pelican Rapids
Brabec, F. J.	Perham
Brabec, P. F.	Perham
Broker, W. S.	Battle Lake
Burnap, W. L.	Fergus Falls
Combacker, L. C.	Fergus Falls
Drought, W. W.	Fergus Falls
Esser, John	Perham
Estrem, C. O.	Fergus Falls
Freeborn, J. A.	Fergus Falls
Halpern, D. J.	Battle Lake
Hand, W. R.	Elbow Lake
Haskell, A. D.	Alexandria
Heiberg, E. A.	Fergus Falls
Houkom, Bjarne	Fergus Falls
Johnson, O. V.	Fergus Falls
Kemp, M. W.	Fergus Falls
Kierland, P. E.	Alexandria
Kittelson, T. N.	Fergus Falls
Lee, W. A.	Fergus Falls
Leibold, H. H.	Parkers Prairie
Lewis, A. J.	Henning
Love, F. A.	Carlos
Naegeli, Frank	Fergus Falls
Nelson, O. N.	Battle Lake
Nelson, W. I.	Underwood
Otto, H. C.	Frazee
Parson, L. R.	Elbow Lake
Patterson, W. L.	Fergus Falls
Paulson, T. S.	Fergus Falls
Platt, F. B.	Battle Lake
Randall, A. M.	Ashby
Rimer, E. W.	Breckenridge
Satersmoen, Theo.	Pelican Rapids
Serkland, J. C.	Rothsay
Tanquist, E. J.	Alexandria
Vail, J. B.	Henning
Ylvisaker, R. S.	Fergus Falls

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of every month except June, July and August
Annual meeting, last Monday in January

President

Goltz, E. V.	St. Paul

Secretary

Schulze, A. G.	St. Paul

Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Alberts, Max W.	St. Paul
Alden, J. F.	St. Paul
Aldes, Harry	St. Paul
Alexander, F. H.	St. Paul
Allen, Mason	St. Paul
Arends, A. L.	Askov
Armstrong, J. M.	St. Paul
Arnquist, A. S.	St. Paul
Aurelius, J. Richards	St. Paul
Backus, Andrew S.	St. Paul
Bacon, Donald K.	St. Paul
Bacon, Knox	St. Paul
Bacon, L. C.	St. Paul
Balcome, F. E.	St. Paul
Barry, L. W.	St. Paul
Barsness, Nellie	St. Paul
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Bell, C. C.	St. Paul
Bennion, P. H.	St. Paul
Bentley, Norman P.	St. Paul
Berrisford, Paul D.	St. Paul
Bicek, Joseph F.	St. Paul
Binger, H. E.	St. Paul
Birnberg, T. L.	St. Paul
Bock, R. A.	St. Paul
Boeckmann, Egil	St. Paul
Bohland, E. H.	St. Paul
Bole, R. S.	St. Paul
Borg, Joseph F.	St. Paul
Bouma, L. R.	St. Paul
Brand, G. D.	St. Paul
Bray, E. R.	St. Paul
Brimhall, J. B.*	St. Paul
Brodie, Walter D.	St. Paul
Brooks, G. F.	St. Paul
Brown, Ed. I.	St. Paul
Brown, John C.	St. Paul
Burch, F. E.	St. Paul
Burfiend, G. H.	St. Paul
Burns, F. W.	St. Paul
Burns, R. M.	St. Paul
Burton, Carl G.	St. Paul
Busher, H.	St. Paul
Caldwell, Jas. P.	St. Paul
Caldwell, Kenneth S.	St. Paul
Cameron, J. A.	St. Paul
Campbell, J. E.	South St. Paul
Carroll, Wm. C.	St. Paul
Carter, Fred G.	St. Paul
Chatterton, C. C.	St. Paul
Christiansen, A.	St. Paul
Christison, J. T.	St. Paul
Clark, T. C.	Minneapolis
Cobb, S. G.	St. Paul
Colby, Woodard	St. Paul
Cole, Wallace H.	St. Paul
Collie, H. G.	St. Paul
Colvin, A. R.	St. Paul
Conner, Wm. H.	Minneapolis
Connor, C. E.	St. Paul
Cottam, Gilbert G.	Minneapolis
Countryman, Roger S.	St. Paul
Cowern, E. W.	North St. Paul
Critchfield, L. R.	St. Paul
Crump, J. W.	St. Paul
Culligan, J. M.	St. Paul
Culligan, Leo C.	Mendota
Dack, Lloyd G.	St. Paul
Darling, J. B.	St. Paul
Daugherty, E. B.	St. Paul
Daugherty, L. E.	St. Paul
Davis, Herbert	St. Paul
Davis, William	St. Paul
Dedolph, Karl	St. Paul
Derauf, B. I.	St. Paul
Dickson, Thos. H., Jr.	St. Paul
Dittman, Geo. C.	St. Paul
Dohm, A. J.	St. Paul
Donohue, P. F.	St. Paul
Dovre, C. M.	St. Paul
Drake, Carl B.	St. Paul
Dunn, J. N.	St. Paul
Dunne, Gerald P.	St. Paul
Earl, George A.	St. Paul
Earl, Robert O.	St. Paul
Edlund, G.	St. Paul
Ely, O. S.	South St. Paul
Emerson, E. C.	St. Paul
Endress, E. K.	St. Paul
Engberg, E. J.	St. Paul
Ernest, G. C.	St. Paul
Eshelby, E. C.	St. Paul
Fahey, E. W.	St. Paul
Ferguson, J. C.	St. Paul
Fesler, Harold H.	St. Paul
Fogarty, Chas. W.	St. Paul
Foley, F. E. B.	St. Paul
Freeman, C. D.	St. Paul
Fulton, John F.*	St. Paul
Gager, E. C.	St. Paul
Garbrecht, Arthur	St. Paul
Gardiner, D. G.	St. Paul
Gardner, Walter P.	St. Paul
Geer, Everett K.	St. Paul
Gehlen, J. N.	St. Paul
Geist, George A.	St. Paul
Ghent, C. Harry	St. Paul
Ghent, M. M.	St. Paul
Gibbs, Edward C.	St. Paul
Gilfillan, J. S.	St. Paul
Ginsberg, Wm.	St. Paul
Goltz, E. V.	St. Paul
Grant, H. W.	St. Paul
Gratzek, Thos.	St. Paul
Gruenhagen, Arnold P.	St. Paul
Hagaman, Geo. K.	St. Paul
Hall, A. R.	St. Paul
Hall, Henry H.	St. Paul
Hammes, E. M.	St. Paul
Hammond, J. F.	St. Paul
Harmon, G. E.	St. Paul
Hartfiel, Wm. F.	St. Paul
Hartley, E. C., Jr.	St. Paul
Hauser, V. P.	St. Paul
Hawkins, V. J.	St. Paul
Heath, A. C.	St. Paul
Heck, Wm. W.	St. Paul
Hedenstrom, F. G.	St. Paul
Hengstler, W. H.	St. Paul
Hensel, C. N.	St. Paul
Herrmann, Edgar T.	St. Paul
Hesselgrave, S. S.	St. Paul
Hilger, A. W.	St. Paul
Hilger, D. D.	St. Paul
Hilger, L. A.	St. Paul
Hiniker, Louis P.	St. Paul
Hochfilzer, J. J.	St. Paul
Hoff, Alfred	St. Paul
Hoffman, Max H.	St. Paul
Holcomb, J. T.	St. Paul
Holcomb, O. W.	St. Paul
Holt, John E.	St. Paul
Howard, W. S.	St. Paul
Hullsiek, Richard B.	St. Paul
Hultkrans, Joel C.	St. Paul
Hunt, H. E.	St. Paul

*Deceased.

Ide, A. W.	St. Paul
Ikeda, Kano	St. Paul
Johnson, Asa M.	St. Paul
Johnson, C. E.	St. Paul
Johnson, Hartland C.	St. Paul
Johnson, J. Arthur	St. Paul
Johnson, Ray G.	St. Paul
Johnson, T. H.	St. Paul
Jones, D. C.	St. Paul
Jones, E. M.	St. Paul
Kadesky, David	St. Paul
Kamman, Gordon R.	St. Paul
Kannary, E. L.	St. Paul
Kelly, John V.	St. Paul
Kelly, Paul H.	St. Paul
Kenefick, E. V.	St. Paul
Kennedy, W. A.	St. Paul
Kenny, H. F.	St. Paul
Kesting, Herman	St. Paul
King, George L.	St. Paul
King, Z. P.	St. Paul
Kistler, A. S.	St. Paul
Klein, H. N.	St. Paul
Knauff, M. K.	St. Paul
Kvitrud, G.	St. Paul
Langenderfer, F. V.	St. Paul
Larsen, C. L.	St. Paul
Lax, Morris H.	St. Paul
Leahy, Bartholomew	St. Paul
Leavenworth, R. O.	St. Paul
Leitch, Archibald	St. Paul
Leonard, Gilbert J.	St. Paul
Lepak, John A.	St. Paul
Lerche, William	Cable, Wisconsin
Levin, Bert	St. Paul
Lewis, W. W.	St. Paul
Lick, C. Louis	St. Paul
Little, W. J.	St. Paul
Lowe, Earl R.	South St. Paul
Lowe, Thomas A.	South St. Paul
Lundholm, A. M.	St. Paul
McBeath, Ewing C.	New York City
McCarthy, W. R.	St. Paul
McClanahan, J. H.	White Bear
McClanahan, T. S.	White Bear
McCloud, C. N.	St. Paul
McKeon, Owen	St. Paul
McLaren, Jennette M.	St. Paul
McNevin, C. F.	St. Paul
Madden, John F.	St. Paul
Martineau, J. L.	St. Paul
Mattson, Carl H.	St. Paul
Meyerding, E. A.	St. Paul
Moga, John A.	St. Paul
Mogilner, S. N.	St. Paul
Molander, H. A.	St. Paul
Moquin, Marie A.	St. Paul
Moran, T. R.	St. Paul
Morrissey, F. B.	St. Paul
Mortenson, N. G.	St. Paul
Moss, Myer N.	St. Paul
Moynihan, T. J.	St. Paul
Muller, R. Theo.	St. Paul
Myers, Thos.	St. Paul
Naegeli, A. E.	St. Paul
Neher, F. H.	St. Paul
Nelson, L. A.	St. Paul
Nippert, H. T.	St. Paul
Noble, John F.	St. Paul
Nordin, C. G.	St. Paul
Norris, Edgar H.	St. Paul
Nye, Katherine A.	St. Paul
Nye, Lillian L.	St. Paul
O'Brien, H. J.*	St. Paul
O'Connor, L. J.	St. Paul
Oerting, Harry	St. Paul
Ogden, Warner	St. Paul
Ohage, Justus, Jr.	St. Paul
Ohage, Justus	St. Paul
Olson, Chas. A.	St. Paul
O'Reilley, B. E.	St. Paul
Ostergren, E. W.	St. Paul
Page, C. V.	St. Paul
Pearson, F. R.	St. Paul
Pedersen, A. H.	St. Paul
Perry, C. G.	St. Paul
Peterson, V. N.	St. Paul
Plondke, F. J.	St. Paul
Prendergast, H. J.	St. Paul
Ramsey, W. R.	St. Paul
Richards, E. T. F.	St. Paul
Richardson, Harold E.	St. Paul
Ritchie, H. P.	St. Paul
Rogers, John T.	St. Paul
Rosenberger, Henry P.	St. Paul
Rosenholtz, Burton	St. Paul
Rosenthal, Robert	St. Paul
Rothrock, J. L.	St. Paul
Rothschild, H. J.	St. Paul
Roy, Philemon	St. Paul
Ruhberg, George N.	St. Paul
Rutherford, W. C.	St. Paul
Ryan, John J.	St. Paul
Ryan, Mark E.	St. Paul
Satterlund, Victor	St. Paul
Savage, F. J.	St. Paul
Schoch, R. B.	St. Paul
Schons, E.	St. Paul
Schuldt, F. C.	St. Paul
Schulze, Albert G.	St. Paul
Schwyzer, Arnold	St. Paul
Senkler, G. E.	St. Paul
Setzer, H. J.	St. Paul
Shannon, W. Ray	St. Paul
Shellman, John L.	St. Paul
Shillington, M. A.	St. Paul
Short, Jacob	St. Paul
Simon, B. F.	St. Paul
Singer, Benj. J.	St. Paul
Skinner, H. O.	St. Paul
Snyder, G. W.	St. Paul
Sohlberg, O. I.	St. Paul
Souster, B. B.	St. Paul
Sprafka, J. M.	St. Paul
Steinberg, C. L.	St. Paul
Sterner, E. G.	St. Paul
Sterner, O. W.	St. Paul
Stevens, F. A.	Lake Elmo
Stewart, Alexander	St. Paul
Stierle, Adolph	St. Paul
Stinnette, S. E.	St. Paul
Stolpestad, H. L.	St. Paul
Swanson, Edwin O.	St. Paul
Swanson, John A.	St. Paul
Swendson, J. J.	St. Paul
Taylor, H. Longstreet*	St. Paul
Teisberg, C. B.	St. Paul
Tregilgas, H. R.	South St. Paul
Van Slyke, Chas. A.	St. Paul
Veirs, Dean	St. Paul
Veirs, Ruby Smith	St. Paul
Von der Weyer, Wm.	St. Paul
Waas, C. W.	St. Paul
Warnock, R. W.	St. Paul
Warren, E. L.	St. Paul
Webber, Fred L.	St. Paul
Welch, M. C.	St. Paul
Werner, O. S.	Cambridge
Wheeler, M. W.	St. Paul
Whitacre, J. C.	St. Paul
Whitcomb, Ed. H.	St. Paul
White, J. S.	St. Paul
Whitmore, Frank	St. Paul
Williams, Clayton	St. Paul
Williamson, George A.	St. Paul
Winnick, J. B.	St. Paul
Wold, K. C.	St. Paul
Zimmermann, H. B.	St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Marshall, Polk, Pennington, Red Lake, Roseau, Norman and Mahnomen Counties

Regular meetings, second Tuesday in April, September and December
Annual meeting, December

President	
Mellby, O. F.	Thief River Falls
Secretary	
Oppegaard, C. L.	Crookston
Adkins, C. M.	Grygla
Anderson, W. S.	Minneapolis
Bernard, B. C.	Thief River Falls
Bertelson, O. L.	Crookston
Biedermann, Jacob	Thief River Falls
Blegen, H. M.	Warren
Bowers, J. T.	Thief River Falls
Bratrud, O. Edward	Thief River Falls
Brown, Lyle L.	Crookston
Button, A. J.	Greenbush
Delmore, J. L.	Roseau
Dunlop, A. H.	Crookston
Engstrand, O. J.	Warren
Froehlich, H. W.	Minneapolis
Henney, W. H.	McIntosh
Hodgson, H. H.	Crookston
Hollands, W. H.	Fisher
Holmstrom, C. H.	Warren
Holte, Halvor	Crookston
Kahala, Arthur	Crookston
Kirk, G. P.	East Grand Forks
Leitch, N. M.	Warren
Locken, O. E.	Crookston
Lynde, Orrin G.	Thief River Falls
Mellby, O. F.	Thief River Falls
Mercil, William F.	Crookston
Morley, G. A.	Crookston
Nelson, H. E.	Crookston
Norman, J. F.	Crookston
Ohnstad, J. L.	McIntosh
Oppegaard, C. L.	Crookston
Oppegaard, M. O.	Crookston
Overend, K. V.	Hallock
Paradis, W. G.	Crookston
Parsons, J. G.	Crookston
Roy, J. A.	Red Lake Falls
Sather, Allen	Fosston
Shaleen, A. W.	Hallock
Shedlov, A.	Fosston
Sheiland, J. T.	Ada
Smith, Archie M.	Thief River Falls
Stuurmanns, S. H.	Erskine
Swedenburg, A. W.	Thief River Falls
Turnbull, Robert	Fosston
Watson, N. M.	Red Lake Falls
Wattam, G. S.	Warren
Wiltrout, I. G.	Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, at call of President
Annual meeting, May

President	
Dubbe, F. H.	New Ulm
Secretary	
Meierding, W. A.	New Ulm
Abraham, Arden L.	Gibbon
Dubbe, F. H.	New Ulm
Dysterheft, Adolph F.	Gaylord
Fritsche, Albert	New Ulm
Fritsche, Carl J.	New Ulm
Fritsche, L. A.*	New Ulm
Gibbons, Francis C.	Comfrey
Goblirsch, A. P.	Sleepy Eye
Graham, W. D.	Hanska
Hammermeister, T. F.	New Ulm
Hovde, Rolf	Winthrop
Jamieson, Earl	Walnut Grove
Johnson, W. E.	Morgan
Kolset, C. D.	Sanborn
Kusske, A. L.	New Ulm
Lindahl, Merlyn J.	Winthrop
McLane, Evelyn G.	Sleepy Eye
McLane, W. O.	Sleepy Eye
Meierding, W. A.	New Ulm
Nuessle, Walter G.	Springfield
Peterson, R. A.	Vesta
Reineke, G. F.	New Ulm
Rothenburg, J. C.	Springfield
Saffert, C. A.	New Ulm
Schoch, J. L.	New Ulm
Seifert, Otto J.	New Ulm
Shrader, J. S.	Springfield
Vogel, J. H.	New Ulm
Weiser, G. B.	New Ulm
Wellcome, J. W. B.	Sleepy Eye
Wieckman, F. H.	Sleepy Eye
Wohlrabe, Clarence	Springfield
Wohlrabe, E. J.	Springfield

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*Deceased.

RICE COUNTY MEDICAL SOCIETY

Annual meeting, December

President
Murdoch, J. M. .... Faribault

Secretary
Plonske, C. J. .... Faribault

Babcock, F. M.	Northfield
Backe, Edmund	Kenyon
Beede, Ethel R.	Faribault
Davis, F. U.	Faribault
Dugan, Lawrence F.	Faribault
Dungay, Neil S.	Northfield
Engstrom, F. A.	Wanamingo
Francis, David W.	Faribault
Haessly, S. B.	Faribault
Hanson, A. M.	Faribault
Haynes, A. L.	Faribault
Huxley, F. R.	Faribault
Kanne, C. W.	Faribault
Kuske, A. W.	Faribault
Lane, Laura A.	Northfield
Lende, Norman	Faribault
Lexa, F. J.	Lonsdale
McBroom, D. E.	Cambridge
Mayland, M. L.	Faribault
Meyer, P. F.	Faribault
Moses, Joseph	Northfield
Murdoch, J. M.	Faribault
Nickerson, W. S.	Faribault
Plonske, C. J.	Faribault
Robilliard, C. M.	Faribault
Robilliard, W. F.*	Faribault
Rudie, C. N.	Kenyon
Rumpf, C. W.	Faribault
Rumpf, W. H.	Faribault
Seeley, I. F.	Northfield
Smith, P. A.	Faribault
Stewart, Gwendolyn	Faribault
Stiles, Angie G.	Northfield
Thorson, Orin P.	Northfield
Traeger, C. A.	Faribault
Warren, F. S.	Faribault
Wilson, Warren	Northfield
Wilson, W. E.	Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

St. Louis, Lake, Cook, Carlton and Itasca Counties
Regular meetings, second Thursday each month except July
Annual meeting, second Thursday, October

President
Gillespie, N. H. .... Duluth

Secretary
Fischer, M. McC. .... Duluth

Abbott, Wm. P.	Duluth
Adams, B. S.	Hibbing
Alexander, C. E.	Duluth
Arminen, K. V.	Duluth
Armstrong, E. L.	Duluth
Athens, A. G.	Duluth
Ayres, G. T.	Ely
Bagley, W. R.	Duluth
Bardon, Richard	Duluth
Barney, L. A.	Duluth
Berdez, G. L.	Duluth
Bergquist, K. E.	Duluth
Bianco, A. J.	Duluth
Binet, H. E.	Grand Rapids
Birkland, O. N.	Hibbing
Blacklock, S. S.	Hibbing
Blakely, C. C.	Barnum
Boman, P. G.	Duluth
Bowen, Robert L.	Hibbing
Boyer, S. H.	Duluth
Braden, A. J.*	Duluth
Braverman, N. J.	Duluth
Bray, C. W.	Biwabik
Buckley, R. P.	Coleraine
Bullen, F. W.	Hibbing
Burns, R. L.	Two Harbors
Cantwell, W. F.	International Falls
Carstens, C. F.	Hibbing
Chapman, T. L.	Duluth
Cheney, E. L.	Duluth
Christensen, E. P.	Two Harbors
Clark, F. F.	Duluth
Clement, Gage	Duluth
Collins, A. N.	Duluth
Collins, H. C.	Duluth
Coventry, W. A.	Duluth
Cummings, Damon W.	Hibbing
Dahlin, I. T.	Aurora
Davis, B. F.	Duluth
Doolittle, L. E.	Dulutb
Doyle, G. C.	Duluth
Drenning, F. C.	Duluth
Eckman, P. F.	Duluth
Ekblad, J. W.	Duluth
Eklund, W. J.	Duluth
Elias, F. J.	Duluth
Emanuel, Karl W.	Duluth
Eppard, R. M.	Cloquet
Estrem, T. A.	Hibbing
Fawcett, K. R.	Duluth
Fellows, Manley F.	Duluth
Ferreira, G. J.	Duluth
Fischer, M. McC.	Duluth
Forbes, R. S.	Duluth
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Goodman, C. E.	Virginia
Gowan, L. R.	Duluth
Graham, David	Duluth
Graham, R. D.	Duluth
Grabam, Robert	Duluth
Graves, W. N.	Duluth
Haney, C. L.	Duluth
Harris, C. N.	Nashwauk
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hayes, M. F.	Nashwauk
Haynes, M. H.	Menahga
Hedberg, G. A.	Nopeming
Heimark, O. E.	Duluth
Hill, F. E.	Duluth
Hirschboeck, F. J.	Duluth
Hirschfield, M. S.	Duluth
Holderman, J. W.	Duluth
Huseby, H. W.	Floodwood
Jacobson, Clarence	Chisbolm
Jensen, T. J.	Duluth
Keyes, C. R.	Duluth
King, W. S.	Eveleth
Kiesling, I. H.	Nasbwauk
Klein, Harry	Duluth
Kliman, F. E.	Duluth
Knapp, F. N.	Duluth
Kohlbry, C. O.	Duluth
Kotchevar, F. R.	Eveleth
Kraft, Peter	Duluth
Krantz, C. I.	Duluth
Kuth, J. R.	Duluth
Laird, A. T.	Nopeming
Lamont, John G.	Nopeming
Leckband, Norbert	Buhl
Lenont, C. B.	Virginia
Lepak, F. J.	Dulutb
Litman, S. N.	Duluth
Loofbourrow, E. H.	Keewatin
Lum, C. E.	Duluth
McCarty, P. D.	Ely
McComb, C. F.	Duluth
McCoy, Mary K.	Duluth
McDaniel, S. P.	Mountain Iron
McDonald, A. L.	Duluth
McGiffert, E. N.*	Duluth
McHaffie, O. L.	Duluth
McLeod, James L.	Bovey
McNutt, John R.	Duluth
Macfarlane, P. H.	Chisholm
MacRae, G. C.	Dulutb
Magie, W. H.	Duluth
Magney, F. H.	Duluth
Manley, J. R.	Duluth
Marsh, H. L.	Eveleth
Martin, E. T.	Duluth
Martin, W. C.	Duluth
Mayne, R. M.	Duluth
Merriman, L. L.	Duluth
Miners, G. A.	Deer River
Moe, Russell J.	Duluth
Moe, Thomas	Moose Lake
Monroe, P. B.	Two Harbors
Mooney, L. P.	Marble
More, C. W.	Eveleth
Morsman, L. W.	Hibbing
Morss, C. R.	Zumbrota
Murray, D. D.*	Duluth
Murray, R. A.	Duluth
Nelson, E. H.	Chisholm
Nelson, R. L.	Duluth
Nicholson, M. A.	Duluth
Nutting, R. E.	Duluth
Olson, A. E.	Duluth
Oredson, O. A.	Duluth
Parker, O. W.	Ely
Pennie, D. F.	Duluth
Power, J. E.	Duluth
Raadquist, C. S.	Hibbing
Raihala, John	Virginia
Raiter, F. W. S.	Cloquet
Raiter, R. F.	Cloquet
Robinson, J. M.	Duluth
Rood, D. C.	Duluth
Rowe, O. W.	Duluth
Rowles, E. K.	Coleraine
Rudie, P. S.	Duluth
Ryan, W. J.	Duluth
Saarf, O. E.	Baudette
Samson, E. R.	Chisholm
Scherer, C. A.	Duluth
Schroder, C. H.	Duluth
Seashore, D. E.	Duluth
Shapiro, E. Z.	Duluth
Shaw, A. W.	Buhl
Sinamark, Andrew	Hibbing
Sisler, C. E.	Grand Rapids
Slyfield, F. F.	Duluth
Smith, C. M.	Duluth
Smith, E. K.	Duluth
Smith, W. R.	Grand Marais
Spicer, F. W.	Duluth
St. Clair, G. G.	Duluth
Strathern, M. L.	Gilbert
Strobel, W. G.	Duluth
Sukeforth, L. A.	Duluth
Sutherland, H. N.	Ely
Swenson, A. O.	Duluth
Taylor, C. W.	Duluth
Tibbetts, M. H.	Duluth
Tilderquist, D. L.	Duluth
Tuohy, E. L.	Duluth
Urberg, S. E.	Duluth
Vercellini, C. E.	Duluth
Wehber, E. E.	Duluth
West, E. J.	Duluth
Whecler, D. W.	Duluth
Wilkinson, Stella	Duluth
Winter, J. A.	Duluth
Young, T. O.	Duluth
Young, V. A.	Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of each month
Annual meeting, second Tuesday in June

President
Emmerson, W. S. .... Mayer

Secretary
Cervenka, C. F. .... New Prague

Bohland, F. J.	Belle Plaine
Buck, Fred H.	Shakopee
Cervenka, Charles F.	New Prague
Eklund, E. J.	Norwood
Emmerson, W. S.	Mayer
Fischer, H. P.	Shakopee
Fischer, P. M.	Shakopee
Halgren, Harry A.	Watertown
Hebeisen, M. B.	Carver
Juergens, H. M.	Belle Plaine
Kolars, J. J.	Le Center
McKeon, James	St. Paul
Maertz, W. F.	New Prague
Martin, T. P.	Arlington
Nagel, H. D.	Waconia
Novak, E. E.	New Prague
Olson, Cbester J.	Belle Plaine
Ormond, Douglas	Waconia
Phillips, W. H.	Jordan
Reiter, H. W.	Shakopee
Schimelpfenig, Geo. T.	Chaska
Schneider, H. A.	Jordan
Simons, B. H.	Chaska
Westerman, A. E.	Montgomery
Westerman, F. C.	Montgomery
Woodworth, L. F.	Le Center
Wunder, Henry E.	Shakopee

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*Deceased.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Pipestone, Rock, Murray, Nobles, Cottonwood and Jackson Counties

Annual meeting, October

President	
Slater, S. A.	Worthington
Secretary	
McKeown, E. G.	Pipestone
Arnold, E. W.	Adrian
Basinger, H. P.	Windom
Basinger, H. R.	Mountain Lake
Benjamin, W. G.	Pipestone
Bofenkamp, F. W.	Luverne
Bong, J. H.	Jasper
Brown, A. H.	Pipestone
Chadbourn, A. G.	Heron Lake
Clark, C. H.	Ruthton
Clark, H. H.	Edgerton
Cress, P. J.	Ellsworth
De Boer, H.	Edgerton
Ditmeier, L. M. Gerber	Jasper
Dolan, C. P.	Worthington
Doms, H. C.	Slayton
Engh, Sigfred	Jackson
Halloran, Walter	Jackson
Hitchings, W. S.	Lakefield
Kelling, Louis F.	Lakefield
Kendahl, A. M.	Jasper
Kilbride, E. A.	Worthington
Lowe, Thos.	Pipestone
McCrea, James	Fulda
McKeown, E. G.	Pipestone
Manson, F. M.	Worthington
Mork, B. O.	Worthington
Nusbaum, D. H.	Jackson
Patterson, W. E.	Westbrook
Pertl, A. L.	Windom
Piper, Wm. A.	Mountain Lake
Portmann, W. C.	Jackson
Rose, J. T.	Lakefield
Ross, W. P.	Worthington
Schutz, Elmer S.	Mountain Lake
Sherman, C. L.	Luverne
Slater, S. A.	Worthington
Smallwood, J. T.	Worthington
Sogge, L.	Windom
Stanley, C. R.	Worthington
Stratte, H. C.	Windom
Taylor, Wm. J.	Pipestone
Thorson, E. O.	Luverne
Tofte, Josephine	Dawson
Waller, J. D.	Wilmont
Watson, F. G.	Worthington
Watson, Sydney	Worthington
Williams, A. B.	St. Paul
Williams, L. A.	Slayton
Wright, C. O.	Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, monthly

Annual meeting, April

President	
Friesleben, Wm.	Sauk Rapids
Beuning, J. B.	Albany
Boehm, J. C.*	St. Cloud
Buscher, Julius C.	St. Cloud
Du Bois, J. A.	Sauk Center
Du Bois, J. F.	Sauk Center
Engstrom, Geo. F.	Belgrade
Freeman, W. L.	St. Cloud
Friesleben, Wm.	Sauk Rapids
Gelz, J. J.	St. Cloud
Goehrs, H. W.	St. Cloud
Haberman, E.	Osakis
Hemstead, Werner	St. Cloud
Holdridge, Geo.	Foley
Johnson, Walfred	Sauk Center
Jones, Richard N.	St. Cloud
Kohler, D. W.	St. Joseph
Koop, S. H.	Richmond
Kuhlmann, August	Melrose
Lewis, C. B.	St. Cloud
Libert, John N.	St. Cloud
McDowell, J. P.	St. Cloud
Mahowald, A.	Albany
Meyer, A. A.	Melrose
Moynihan, A. F.	Sauk Center
Rathbun, A. M.	Rice
Rathbun, C. A.	St. Cloud
Richards, W. B.	St. Cloud
Ridgway, Alexander	South Haven
Schatz, F. J.	St. Cloud
Sherwood, G. E.	Kimball
Stangl, Fred	St. Cloud
Stickney, Charlotte A.	St. Cloud
Sutton, Chas. S.	St. Cloud
Sweetman, R. H.	Sauk Center
Wenner, W. T.	St. Cloud
Zachman, A. H.	Melrose

STEELE COUNTY MEDICAL SOCIETY

Annual meeting, second Tuesday in November

President	
McIntyre, J. A.	Owatonna
Secretary	
Dewey, D. H.	Owatonna
Dewey, Donald H.	Owatonna
Ertel, Edward Q.	Ellendale
Flores, O. T.	Dodge Center
Gault, C. C.*	Owatonna
McIntyre, John A.	Owatonna
Melby, Benedik	Blooming Prairie
Nelson, Ernest J.	Owatonna
Schaefer, Joseph F.	Owatonna
Senn, E. W.	Owatonna
Smersh, J. F.	Owatonna
Stewart, A. B.	Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching, Hubbard and Beltrami Counties

Regular meetings, Spring, Summer, Fall

Annual meeting, January

President	
McHugh, R. F.	Aitkin
Secretary	
Van Valkenburg, F. W.	Long Prairie
Agnew, A. T.	International Falls
Allen, F. H.	Staples
Badeaux, G. I.	Brainerd
Beise, R. A.	Brainerd
Borreson, Baldwin	Ah-Gwah-Ching
Borgerson, A. H.	Hewitt
Burns, H. A.	Ah-Gwa-Ching
Christie, G. R.	Long Prairie
Christie, R. L.	Long Prairie
Cook, J. M.	Staples
Corrigan, J. E.	Spooner
Craig, C. C.	International Falls
Davis, L. T.	Wadena
Davis, T. C.	Wadena
Frost, H. T.	Wadena
Garlock, A. V.	Bemidji
Garlock, D. H.	Bemidji
Gerber, M. P.	Brainerd
Grawn, F. A.	Northome
Grogan, J. S.	Wadena
Groschupf, T. P.	Bemidji
Grose, F. N.	Clarissa
Hanson, E. C.	Park Rapids
Hawkinson, J. P.	Crosby
Hawkinson, L. F.	Brainerd
Healy, R. T.	Pierz
Hendrickson, R. R.	Wadena
Holst, C. F.	Little Falls
Holst, J. B.	Little Falls
House, Z. E.	Cass Lake
Houston, C. A.	Park Rapids
Hubin, E. G.	Deerwood
Jamieson, E. F.	Brainerd
Johnson, E. W.	Bemidji
Kelly, B. W.	Aitkin
Kenyon, Paul	Wadena
Kerlan, S. Z.	Aitkin
Larson, L. M.	Oak Terrace
Larson, Leroy J.	Bagley
Laughlin, J. T.	Grey Eagle
Lodmell, E. A.	Sebeka
McHugh, R. F.	Aitkin
Marcum, E. H.	Bemidji
Mark, Hilbert,	Ah-Gwah-Ching
Miller, W. A.	New York Mills
Moyer, R. E.	Bemidji
Nelson, Nesmith	Brainerd
Osburn, B. F.	International Falls
Pierce, C. H.	Wadena
Ringle, O. F.	Walker
Roberts, L. M.	Little Falls
Rosenfield, A. B.	Pequot
Sach-Rowitz, Alvin	McGregor
Shannon, S. S.	Crosby
Simons, E. J.	Swanville
Smith, B. A.	Crosby
Smith, E. H.	Bemidji
Thabes, J. A., Sr.	Brainerd
Van Valkenburg, B. F.	Long Prairie
Van Valkenburg, F. W.	Long Prairie
Watson, J. D.	Holdingford
Will, W. W.	Bertha
Withrow, M. E.	International Falls

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*Deceased.

WABASHA COUNTY MEDICAL SOCIETY

Annual meeting, first Thursday after first Monday in July

President
Wilson, W. F. .... Lake City

Secretary
Frost, R. H. .... Wabasha

Bayley, E. C.	Lake City
Bowers, H. E.	Lake City
Cochrane, W. J.	Lake City
Collins, J. S.	Wabasha
Dempsey, D. P.	Kellogg
Fleischhauer, D. S.	Wabasha
Frost, R. H.	Wabasha
Radabaugh, R. C.	Hastings
Replogle, W. H.	Wabasha
Slocumb, J. A.	Plainview
Stryker, W. B.	Plainview
Wilson, W. F.	Lake City

WASECA COUNTY MEDICAL SOCIETY

Annual meeting, second Friday in December

President
Gallagher, B. J. .... Waseca

Secretary
Tavenner, L. J. .... Waseca

Bernstein, W. C.	New Richland
Gallagher, B. J.	Waseca
Hagen, H. O.	New Richland
McIntyre, H. M.	Waseca
O'Hara, J. J.*	Janesville
Saliterman, B. I.	Janesville
Swenson, O. J.	Waseca
Tavenner, L. J.	Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of month, except June, July and August
Annual meeting, second Tuesday in December

President
Strand, E. V. .... Bayport

Secretary
Boleyn, E. S. .... Stillwater

Boleyn, E. S.	Stillwater
Haines, J. H.	Stillwater
Hewson, Wilfred J.	Stillwater
Humphrey, W. R.	Stillwater
Josewski, R. J.	Stillwater
Kalinoff, D.	Stillwater
Petraborg, H. T.	Stillwater
Poirier, J. A.	Forest Lake
Sherman, C. H.	Bayport
Strand, E. V.	Bayport
Stuhr, J. W.	Stillwater
Thompson, V. C.	Marine-on-St. Croix
Van Meier, Henry	Stillwater

WATONWAN COUNTY MEDICAL SOCIETY

Regular meetings, on call
Annual meeting, December

President
Bergman, O. B. .... St. James

Secretary
Grimes, H. B. .... Madelia

Bergman, O. B.	St. James
Bratrude, E. J.	St. James
Bregel, Fred L.	St. James
Grimes, H. B.	Madelia
Hagen, O. E.	Butterfield
McCarthy, W. J.	Madelia
Thompson, Albert	St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Traverse, Pope and Stevens Counties
Regular meetings, January, April, June and October
Annual meeting, first Wednesday in October

President
Doleman, N. F. .... Tintah

Secretary
Lindberg, A. L. .... Wheaton

Arneson, A. I.	Starbuck
Bergan, Otto	Clinton
Bolsta, Chas.	Ortonville
Caine, C. E.	Morris
Christenson, C. R.	Minneapolis
Doleman, N. F.	Tintah
Eberlin, E. A.	Glenwood
Elsey, E. McC.	Glenwood
Elsey, J. R.	Glenwood
Ewing, C. F.	Wheaton
Fitzgerald, E. T.	Morris
Giesen, A. F.	Starbuck
Karn, B. R.	Ortonville
Leland, J. T.	Herman
Lindberg, A. L.	Wheaton
McIver, B. A.	Lowry
O'Donnell, D. M.	Ortonville
Oliver, C. I.	Graceville
Oliver, I. L.	Graceville
Pierson, Claude M.*	Wheaton
Ransom, M. L.	Hancock
Shelver, H. J.	Ortonville

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July and October
Annual meeting, first Monday in January

President
Mattison, P. A. .... Winona

Secretary
Steiner, I. W. .... Winona

Benoit, F. T.	Winona
Clay, F. H.	St. Charles
Dierkes, G. J.	Rollingstone
Fetter, Mary	Winona
Heise, W. F. C.	Winona
Keyes, E. D.	Winona
Keyes, J. D.	Winona
Kreuzer, T. C.	Owatonna
Lichtenstein, H.	Winona
McDonnell, C. H.*	Winona
McLaughlin, E. M.	Winona
Mattison, P. A.	Winona
Meinert, A. E.	Winona
Nauth, W. W.	Winona
Neumann, C. A.	Winona
Page, R. L.	St. Charles
Pritchard, D. B.*	Winona
Risser, E. D.	Winona
Robbins, C. P.	Winona
Satterlee, H. W.	Lewiston
Schaefer, S.	Winona
Steiner, I. W.	Winona
Tweedy, G. J.	Winona
Walker, G. H.	Winona
Wilson, R. H.	Winona
Younger, L. I.	Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, second Tuesday in October

President
Ellison, F. E. .... Monticello

Secretary
Catlin, J. J. .... Buffalo

Bendix, L. H.	Annandale
Catlin, J. J.	Buffalo
Clark, H. E.	Howard Lake
Ellison, F. E.	Monticello
Freed, O. J. R.	Cokato
Harriman, L.	Howard Lake
Hart, W. E.	Monticello
Johnson, V. P.	Delano
Klaveness, E.	St. Paul
Lee, J. L.	Watertown
Norris, G. H.	Annandale
Olson, J. Wm.	Cokato
Peterson, O. L.	Cokato
Phillips, A. E.	Delano
Ridgway, A. M.	Annandale
Roholt, C. L.	Waverly
Rousseau, Victor	Maple Lake
Swezey, B. F.	Buffalo

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*Deceased.

ALPHABETICAL ROSTER

Name	Address
Aanes, A. M.	Red Wing
Abbott, Wm. P.	Duluth
Aborn, W. H.	Hawley
Abraham, A. L.	Gibbon
Adams, B. S.	Hibbing
Adams, R. C.	Bird Island
Adkins, C. M.	Grygla
Adson, A. W.	Rochester
Affeldt, D. E.	Kasson
Agnew, A. T.	International Falls
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Aitkens, H. B.	Le Center
Alberts, M. W.	St. Paul
Alden, J. F.	St. Paul
Aldes, Harry	St. Paul
Alderson, L. R.	Rochester
Alexander, C. E.	Duluth
Alexander, F. H.	St. Paul
Alexander, H. A.	Minneapolis
Aling, C. P.	Minneapolis
Allan, F. N.	Rochester
Allen, A. W.	Austin
Allen, C. C.	Austin
Allen, E. V.	Rochester
Allen, F. H.	Staples
Allen, H. W.	Minneapolis
Allen, Mason	St. Paul
Allen, R. B.	Rochester
Allen, R. W.	Rochester
Allen, W. A.	Rochester
Allison, R. G.	Minneapolis
Almquist, H. E.	Minneapolis
Altnow, H. O.	Minneapolis
Alvarez, W. C.	Rochester
Amberg, Samuel	Rochester
Andersen, A. G.	Minneapolis
Andersen, S. C.	Minneapolis
Anderson, A. S.	St. Paul
Anderson, C. M.	Rochester
Anderson, D. D.	Minneapolis
Anderson, E. D.	Minneapolis
Anderson, E. R.	Minneapolis
Anderson, F. J.	Minneapolis
Anderson, J. K.	Minneapolis
Anderson, K. W.	Minneapolis
Anderson, M. J.	Rochester
Anderson, N. E.	Harmony
Anderson, P. A.	Minneapolis
Anderson, R. E.	Willmar
Anderson, S. H.	Red Wing
Anderson, W. S.	Minneapolis
Andreassen, E. C.	Minneapolis
Andrews, J. W.	Mankato
Andrews, R. N.	Mankato
Annis, H. B.	Minneapolis
Archibald, F. M.	Mahnomen
Arends, A. L.	Askov
Arey, H. C.	Excelsior
Arminen, K. V.	Duluth
Armstrong, E. L.	Duluth
Armstrong, J. M.	St. Paul
Arneson, A. I.	Starbuck
Arnquist, A. S.	St. Paul
Arnold, E. W.	Adrian
Arnson, J. M.	Benson
Arvidson, C. G.	Minneapolis
Athens, A. G.	Duluth
Atkinson, Walter	Rochester
Aune, Martin	Minneapolis
Aurand, W. H.	Minneapolis
Aurelius, J. R.	St. Paul
Avery, J. F.	Minneapolis
Ayres, G. T.	Ely
Babcock, F. M.	Northfield
Backe, E.	Kenyon
Backus, Andrew S.	St. Paul
Bacon, D. K.	St. Paul
Bacon, Knox	St. Paul
Bacon, L. C.	St. Paul
Bacon, R. S.	Montevideo
Badeaux, G. I.	Brainerd
Bagley, W. R.	Duluth
Bailey, H. B.	Fairmont
Baken, M. P.	Minneapolis
Baker, A. C.	Fergus Falls
Baker, A. T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, Harry R.	Hayfield
Baker, Looe	Minneapolis
Baker, N. H.	Fergus Falls
Balcome, F. E.	St. Paul
Balfour, D. C.	Rochester
Ball, R. G.	Rochester
Bannick, E. G.	Rochester
Barber, J. P.	Minneapolis
Barber, K. W.	Rochester
Barborka, C. J.	Rochester
Bardon, Richard	Duluth
Bargen, J. A.	Rochester
Barker, N. W.	Rochester
Barnes, A. R.	Rochester
Barney, L. A.	Duluth
Barron, Moses	Minneapolis
Barry, L. W.	St. Paul
Barsness, Nellie	St. Paul
Bartels, E. C.	Rochester
Basinger, H. P.	Windom
Basinger, H. R.	Mountain Lake
Bass, G. W.	Minneapolis
Baxter, S. H.	Minneapolis
Bayard, H. F.	Minneapolis
Bayley, E. C.	Lake City
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beard, A. H.	Minneapolis
Beard, R. O.	Minneapolis
Bedford, E. W.	Minneapolis
Beede, Ethel R.	Faribault
Behmler, F. W.	Appleton
Beise, R. A.	Brainerd
Beiswanger, R. H.	Wykoff
Bell, C. C.	St. Paul
Bell, E. T.	Minneapolis
Bell, J. W.	Minneapolis
Belote, G. B.	Caledonia
Benedict, E. E.	Minneapolis
Bendix, L. H.	Annandale
Benedict, W. L.	Rochester
Benepe, J. L.	Dent
Benham, E. W.	Mankato
Benjamin, A. E.	Minneapolis
Benjamin, W. G.	Pipestone
Benn, F. G.	Minneapolis
Bennett, R. J., Jr.	Rochester
Bennion, P. H.	St. Paul
Benoit, F. T.	Winona
Bentley, N. P.	St. Paul
Berdez, G. L.	Duluth
Bergan, Otto	Clinton
Berger, E. H.	Rochester
Bergh, L. N.	Montevideo
Bergheim, M. C.	Hawley
Bergman, O. B.	St. James
Bergquist, K. E.	Duluth
Berkman, D. M.	Rochester
Berkman, J. M.	Rochester
Berkwitz, N. J.	Minneapolis
Bernard, B. C.	Thief River Falls
Bernstein, W. C.	New Richland
Berrisford, P. D.	St. Paul
Bertelson, O. L.	Crookston
Bessesen, A. N., Sr.	Minneapolis
Bessesen, A. N., Jr.	Minneapolis
Bessesen, W. A.	Minneapolis
Beuning, J. B.	Albany
Bianco, A. J.	Duluth
Bicek, J. F.	St. Paul
Biedermann, Jacob	Thief River Falls
Billings, R. E.	Franklin
Binet, H. E.	Grand Rapids
Binger, H. E.	St. Paul
Binger, M. W.	Rochester
Birkland, O. N.	Hibbing
Birnberg, T. L.	St. Paul
Black, William	Mankato
Blacklock, S. S.	Hibbing
Blake, James	Hopkins
Blakely, C. C.	Barnum
Blanchard, H. G.	Fairmont
Blaustone, H. H.	Minneapolis
Blegen, H. M.	Warren
Blumenthal, Jacob	Minneapolis
Bock, R. A.	St. Paul
Bockman, M. W. H.	Minneapolis
Boeckmann, Egil	St. Paul
Boehm, J. C.*	St. Cloud
Bohland, E. H.	St. Paul
Bohland, F. J.	Belle Plaine
Boies, L. R.	Minneapolis
Bofenkamp, F. W.	Luverne
Bole, R. S.	St. Paul
Boleyn, E. S.	Stillwater
Bolsta, Chas.	Ortonville
Boman, P. G.	Duluth
Bong, J. H.	Jasper
Booth, A. E.	Minneapolis
Boothby, W. M.	Rochester
Boreen, C. A.	Minneapolis
Borg, J. F.	St. Paul
Borgeson, E. J.	Minneapolis
Borgerson, A. H.	Hewitt
Borreson, Baldwin	Ah-Gwah-Ching
Bossingham, O. N.	Lake Benton
Bottolfson, B. T.	Moorhead
Boudry, M. O.	Rochester
Bouma, L. R.	St. Paul
Bouman, H. A.	Minneapolis
Bowen, R. L.	Hibbing
Bowers, H. E.	Lake City
Bowers, J. T.	Thief River Falls
Bowing, H. H.	Rochester
Boyer, S. H.	Duluth
Boynton, Ruth	Minneapolis
Boysen, H.	Welcome
Boysen, Peter	Pelican Rapids
Braasch, W. F.	Rochester
Brabec, F. J.	Perham
Brabec, P. F.	Perham
Bracken, H. M.	Claremont, Calif.
Braden, A. J.*	Duluth
Brand, G. D.	St. Paul
Brand, W. A.	Redwood Falls
Branham, D. S.	Albert Lea
Branton, A. F.	Willmar
Branton, B. J.	Willmar
Bratrud, A. F.	Minneapolis
Bratrud, O. E.	Thief River Falls
Bratrude, E. J.	St. James
Brav, E. A.	Rochester
Braverman, N. J.	Duluth
Bray, C. W.	Biwabik
Bray, E. R.	St. Paul
Bregel, F. L.	St. James
Brekke, H. J.	Caledonia
Brigham, Frank	Watkins
Brimhall, J. B.*	St. Paul
Broders, A. C.	Rochester
Brodie, W. D.	St. Paul
Broker, W. S.	Battle Lake
Brooks, G. F.	St. Paul
Brown, A. E.	Rochester
Brown, A. H.	Pipestone
Brown, E. D.	Minneapolis
Brown, E. I.	St. Paul
Brown, Edw. J.	Minneapolis
Brown, G. E.	Rochester
Brown, J. C.	St. Paul
Brown, L. L.	Crookston
Brown, P. W.	Rochester
Brown, R. W.	Rochester
Brownstone, Manuel	Sandstone
Brunsting, L. A.	Rochester
Brusegard, J. F.	Red Wing
Bryant, O. R.	Minneapolis
Buck, F. H.	Shakopee
Buckley, R. P.	Coleraine
Buie, L. A.	Rochester
Bulkley, Kenneth	Minneapolis
Bullard, Mattie J.	Minneapolis
Bullen, F. W.	Hibbing
Bumpus, H. C.	Rochester
Burch, F. E.	St. Paul
Burfiend. G. H.	St. Paul
Burke, C. F.	Rochester
Burkley, G. G.	Rochester
Burnap, W. L.	Fergus Falls
Burns, F. W.	St. Paul
Burns, H. A.	Ah-Gwah-Ching
Burns, H. D.	Albert Lea
Burns, M. A.	Milan
Burns, R. L.	Two Harbors
Burns, R. M.	St. Paul
Burton, C. G.	St. Paul
Buscher, J. C.	St. Cloud
Busher, H.	St. Paul
Butler, John	Minneapolis
Button, A. J.	Greenbush
Butturff, C. R.	Freeborn
Butz, J. A.	Monterey
Butzer, J. A.	Mankato
Buzzelle, L. K.	Minneapolis
Cable, M. L.	Minneapolis
Cabot, C. M.	Rochester
Cabot, G. S.	Minneapolis
Cabot, Hugh	Rochester
Cabot, V. S.	Minneapolis
Cady, L. H.	Minneapolis
Cain, E. F.	Rochester
Caine, C. E.	Morris
Caldwell, K. S.	St. Paul
Caldwell, J. P.	St. Paul
Caldwell, J. M.	Rochester
Calhoun, F. W.	Albert Lea
Callahan, F. F.	Pokegama
Callerstrom, G. W.	Minneapolis
Cameron, Isabell	Minneapolis
Cameron, J. A.	St. Paul
Cameron, M. C., Jr.	Rochester
Camp, J. D.	Rochester
Camp, W. E.	Minneapolis
Campbell, J. E.	So. St. Paul
Campbell, L. M.	Minneapolis
Campbell, O. J.	Minneapolis

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*Deceased.

Campbell, R. A.	Minneapolis
Canfield, W. W.	Houston
Cantwell, W. F.	International Falls
Cardle, A. E.	Minneapolis
Carey, J. B.	Minneapolis
Carlaw, C. M.	Minneapolis
Carlson, Lawrence	Minneapolis
Carman, J. E.	Detroit Lakes
Caron, R. P.	Minneapolis
Carroll, W. C.	St. Paul
Carstens, C. F.	Hibbing
Carter, F. G.	St. Paul
Castleton, K. B.	Rochester
Catlin, J. J.	Buffalo
Cavanor, F. T.	Minneapolis
Cervenka, C. F.	New Prague
Chadbourn, A. G.	Heron Lake
Chamberlain, H. E.	Minneapolis
Chambers, W. C.	Blue Earth
Chapman, C. B.	Rochester
Chapman, T. L.	Duluth
Chatterton, C. C.	St. Paul
Cheleen, S. J.	Minneapolis
Cheney, E. L.	Duluth
Cherry, C. H.	Minneapolis
Chesley, A. J.	Minneapolis
Christensen, E. E.	Rochester
Christensen, E. P.	Two Harbors
Christenson, C. R.	Minneapolis
Christianson, A.	St. Paul
Christianson, H. W.	Rochester
Christie, G. R.	Long Prairie
Christie, R. L.	Long Prairie
Christison, J. T.	St. Paul
Church, G. T.	Rochester
Cilley, E. I. L.	Rochester
Clark, C. H.	Ruthton
Clark, F. F.	Duluth
Clark, H. E.	Howard Lake
Clark, H. H.	Edgerton
Clark, H. S.	Minneapolis
Clark, T. C.	Minneapolis
Clay, F. H.	St. Charles
Claydon, D. R.	Red Wing
Claydon, L. E.	Red Wing
Clement, Gage	Duluth
Clement, J. B.	Lester Prairie
Cobb, S. G.	St. Paul
Cobb, W. F.	Lyle
Cochrane, W. J.	Lake City
Cohen, S. S.	Oak Terrace
Colby, Woodard	St. Paul
Cole, H. B.	Redwood Falls
Cole, W. H.	St. Paul
Coleman, F. B.	Austin
Collie, H. G.	St. Paul
Collins, A. N.	Duluth
Collins, D. C.	Rochester
Collins, H. C.	Duluth
Collins, J. S.	Wabasha
Colvin, A. R.	St. Paul
Comhacker, L. C.	Fergus Falls
Comfort, M. W.	Rochester
Condit, W. H.	Minneapolis
Conner, H. M.	Rochester
Conner, W. H.	Minneapolis
Connor, C. E.	St. Paul
Cook, E. N.	Rochester
Cook, J. M.	Staples
Cook, H. W.	Minneapolis
Cooney, H. C.	Princeton
Cooper, M. D.	Winnebago
Cooperman, H. O.	Minneapolis
Corbett, J. F.	Minneapolis
Corniea, A. D.	Minneapolis
Corrigan, J. E.	Spooner
Cosgriff, J. A.	Olivia
Cosman, E. O.	Minneapolis
Costello, R. T.	Rochester
Cottam, Gilbert	Minneapolis
Counseller, V. S.	Rochester
Countryman, R. S.	St. Paul
Covell, W. W.	St. Peter
Coventry, W. A.	Duluth
Cowern, E. W.	North St. Paul
Cox, F. W.	Rochester
Craddock, W. H.	Rochester
Crafts, L. M.	Minneapolis
Craig, C. C.	International Falls
Craig, W. McK.	Rochester
Cranmer, R. R.	Minneapolis
Cranston, R. W.	St. Louis Park
Creighton, R. H.	Minneapolis
Cremer, M. H.	Red Wing
Crenshaw, J. L.	Rochester
Cress, E. E.	Boyd
Cress, P. J.	Ellsworth
Crewe, J. E.	Rochester
Crisp, N. W.	Rochester
Critchfield, L. R.	St. Paul
Cronwell, B. J.	Austin
Crump, J. W.	St. Paul
Culligan, J. M.	St. Paul
Culligan, L. C.	Mendota
Cummings, D. W.	Hibbing
Curry, F. S.	Rochester
Curtin, J. F.	Minneapolis
Cutts, George	Minneapolis
Cutts, R. E.	Rochester
Dack, L. G.	St. Paul
Dady, E. E.	Minneapolis
Dahl, E. O.	Minneapolis
Dahl, G. A.	Mankato
Dahl, J. A.	Minneapolis
Dahlin, I. T.	Aurora
Dahlstrom, A. W.	Minneapolis
Daignault, Oscar	Benson
Daniel, D. H.	Minneapolis
Daniel, L. M.	Minneapolis
Daniels, J. W.	St. Peter
Daniels, L. E.	Rochester
Danielson, K. A.	Litchfield
Darling, J. B.	St. Paul
Dart, L. O.	Minneapolis
Daugherty, E. B.	St. Paul
Daugherty, L. E.	St. Paul
Davis, A. C.	Rochester
Davis, B. F.	Duluth
Davis, F. U.	Faribault
Davis, Herbert	St. Paul
Davis, I. G.	Rushford
Davis, L. T.	Wadena
Davis, T. C.	Wadena
Davis, William	St. Paul
De Boer, Hermanus	Edgerton
De Carle, Donald W.	Rochester
Decker, F. H.	Rochester
Dedolph, Karl	St. Paul
Delmore, J. L.	Roseau
Dempsey, D. P.	Kellogg
Denman, A. V.	Mankato
Derauf, B. I.	St. Paul
Desjardins, A. U.	Rochester
Devereaux, T. J.	Wayzata
Dewar, J. E.	Minneapolis
Dewey, D. H.	Owatonna
Deziel, G.	Minneapolis
Dickson, T. H., Jr.	St. Paul
Diehl, H. S.	Minneapolis
Dierkes, G. J.	Rollingstone
Diessner, H. D.	Minneapolis
Ditmeier, L. M. G.	Jasper
Dittman, G. C.	St. Paul
Dixon, C. F.	Rochester
Dixon, R. K.	Rochester
Dodge, F. A.	LeSueur
Dohm, A. J.	St. Paul
Dolder, F. C.	Eyota
Dolan, C. P.	Worthington
Doleman, N. F.	Tintah
Doms, H. C.	Slayton
Donald, J. M.	Rochester
Donaldson, C. A.	Mesa, Arizona
Donohue, P. F.	St. Paul
Doolittle, L. E.	Duluth
Dordal, J.	Sacred Heart
Dorge, R. I.	Minneapolis
Dornblaser, H. B.	Minneapolis
Dorsey, G. C.	Minneapolis
Dovre, C. M.	St. Paul
Down, H. I.	Rochester
Dowswell, W. J.	Kerkhoven
Doxey, G. L.	Minneapolis
Doyle, G. C.	Duluth
Doyle, L. O.	Minneapolis
Drake, C. B.	St. Paul
Drake, C. R.	Minneapolis
Drake, F. A.	Lanesboro
Dredge, H. P.	Sandstone
Dreisbach, N.	Minneapolis
Drenning, F. C.	Duluth
Drips, D. G.	Rochester
Droegemuller, E. H.	Rochester
Drought, W. W.	Fergus Falls
Dubbe, F. H.	New Ulm
Du Bois, J. A.	Sauk Center
Du Bois, J. F.	Sauk Center
Duff, E. R.	Minneapolis
Dugan, L. F.	Farihault
Dukelow, D. A.	St. Charles
Dulude, Stephane	Dassel
Dungay, N. S.	Northfield
Dunlap, E. H.	Minneapolis
Dunlap, H. F.	Rochester
Dunlop, A. H.	Crookston
Dunlop, J. G., Jr.	Rochester
Dunn, G. R.	Minneapolis
Dunn, J. N.	St. Paul
Dunne, G. P.	St. Paul
Durgin, F. L.	Winnebago
Duryea, Marbry	Minneapolis
Dutton, C. E.	Minneapolis
Dworsky, S. D.	Minneapolis
Dysterheft, A. F.	Gaylord
Earl, G. A.	St. Paul
Earl, R. O.	St. Paul
Eberlin, E. A.	Glenwood
Eby, C. B.	Spring Valley
Eckman, P. F.	Duluth
Eckstein, A. W.	Mankato
Edlund, G.	St. Paul
Edward, George	Canton
Edwards, G. C.	Grove City
Edwards, R. T.	Elysian
Egilsrud, Kristian	Minneapolis
Ehmke, W. C.	Willow River
Ehrenberg, C. J.	Minneapolis
Ehrlich, S. P.	Minneapolis
Eitel, G. D.	Minneapolis
Ekblad, J. W.	Duluth
Eklund, E. J.	Norwood
Eklund, W. J.	Duluth
Elias, F. J.	Duluth
Ellingson, A. R.	Detroit Lakes
Ellison, D. E.	Minneapolis
Ellison, F. E.	Monticello
Elsey, E. M.	Glenwood
Elsey, J. R.	Glenwood
Ely, O. S.	South St. Paul
Emanuel, K. W.	Duluth
Emerson, E. C.	St. Paul
Emmerson, W. S.	Mayer
Emmett, J. L.	Rochester
Emmons, W. F.	Rochester
Emond, A. J.	Minneapolis
Endress, E. K.	St. Paul
Engberg, E. J.	St. Paul
Engh, Sigfred	Jackson
Engstrand, O. J.	Warren
Engstrom, F. A.	Wanamingo
Engstrom, G. F.	Belgrade
Eppard, R. M.	Cloquet
Erb, F. A.	Minneapolis
Erdmann, C. A.	Minneapolis
Erickson, R. F.	Minneapolis
Ericson, J. G.	Minneapolis
Ericson, R. M.	Minneapolis
Ericson, Swan	Le Sueur
Ernest, G. C.	St. Paul
Ertel, E. Q.	Ellendale
Eshelby, E. C.	St. Paul
Esser, John	Perham
Estrem, C. O.	Fergus Falls
Estrem, T. A.	Hibbing
Eusterman, G. B.	Rochester
Evans, E. T.	Minneapolis
Evans, R. D.	Minneapolis
Evans, V. L.	Rochester
Evarts, A. B.	Rochester
Everlof, J. L.	Minneapolis
Ewbank, J. N.	Minneapolis
Ewing, C. F.	Wheaton
Exley, E. W. F.	Minneapolis
Fahey, E. W.	St. Paul
Fahr, G. E.	Minneapolis
Fansler, W. A.	Minneapolis
Farr, R. E.	Minneapolis
Faust, L. S.	Rochester
Fauster, J. U., Jr.	Rochester
Fawcett, C. E.	Stewartville
Fawcett, K. R.	Duluth
Feeney, J. M.	Minneapolis
Fellows, M. F.	Duluth
Fenger, E.	Oak Terrace
Ferguson, J. C.	St. Paul
Ferreira, G. J.	Duluth
Fetter, Mary	Winona
Fetterly, Warren	Minneapolis
Fesler, H. H.	St. Paul
Figi, F. A.	Rochester
Fiksdal, M. J.	Willmar
Fink, L. W.	Minneapolis
Fink, W. H.	Minneapolis
Finney, W. P., Jr.	Rochester
Fischer, H. P.	Shakopee
Fischer, M. McC.	Duluth
Fischer, P. M.	Shakopee
Fitzgerald, D. F.	Minneapolis
Fitzgerald, E. T.	Morris
Fjeldstad, C. A.	Minneapolis
Flagstad, A. E.*	Minneapolis
Fleischhauer, D. S.	Wabasha
Flinn, T. E.	Redwood Falls
Flom, A. O.	Chisago City
Flores, O. T.	Dodge Center
Flower, W. Z.	Minneapolis
Fogarty, C. W.	St. Paul
Foley, F. E. B.	St. Paul
Folken, F. G.	Albert Lea
Folta, John	Ceylon
Foor, C. G.	Rochester
Forbes, R. S.	Duluth
Ford, B. C.	Marshall
Ford, Frances A.	Rochester
Fortin, H. J.	Rochester
Fortney, G. O.	Zumbrota

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*Deceased.

Foshager, H. T.	Clara City
Fowler, L. H.	Minneapolis
Fox, John M.	Minneapolis
Franchere, F. W.	Lake Crystal
Francis, D. W.	Faribault
Fredericks, G. M.	Minneapolis
Freeborn, J. A.	Fergus Falls
Freed, O. J. R.	Cokato
Freeman, C. D.	St. Paul
Freeman, G. H.	St. Peter
Freeman, J. P.	Albert Lea
Freeman, W. L.	St. Cloud
Freligh, W. P.	Albert Lea
Fricke, R. E.	Rochester
Friedell, A.	Minneapolis
Friesleben, Wm.	Sauk Rapids
Frisch, F. P.	Willmar
Fritsche, Albert	New Ulm
Fritsche, C. J.	New Ulm
Fritsche, L. A.*	New Ulm
Froehlich, H. W.	Minneapolis
Frost, E. H.	Willmar
Frost, H. T.	Wadena
Frost, R. H.	Wabasha
Fugina, G. R.	Mankato
Fulcher, O. H.	Rochester
Fulton, J. F.*	St. Paul
Funk, V. K.	Oak Terrace

Gaarde, F. W.	Rochester
Gager, E. C.	St. Paul
Gaines, E. C.	Buffalo Lake
Gallagher, B. J.	Waseca
Gamble, J. W.	Albert Lea
Gamble, P. M.	Albert Lea
Gamble, R. M.	Albert Lea
Gammell, J. H.	Minneapolis
Garbrecht, Arthur	St. Paul
Gardiner, D. G.	St. Paul
Gardner, E. L.	Minneapolis
Gardner, V. H.	Fairmont
Gardner, W. P.	St. Paul
Garlock, A. V.	Bemidji
Garlock, D. H.	Bemidji
Gault, C. C.*	Owatonna
Geer, E. K.	St. Paul
Gehlen, J. N.	St. Paul
Geist, E. S.	Minneapolis
Geist, G. A.	St. Paul
Gelz, J. J.	St. Cloud
Gerber, M. P.	Brainerd
Germo, Chas.	Balaton
Ghent, C. H.	St. Paul
Ghent, M. M.	St. Paul
Ghormley, R. K.	Rochester
Gibbons, F. C.	Comfrey
Gibbs, E. C.	St. Paul
Gibson, G. G.	Rochester
Giere, E. O.	Minneapolis
Giere, J. C.	Minneapolis
Giere, R. W.	Benson
Giere, S. W.	Benson
Giesen, A. F.	Starbuck
Giessler, P. W.	Minneapolis
Giffin, H. Z.	Rochester
Gilfillan, J. S.	St. Paul
Gilles, F. L.	Minneapolis
Gillespie, J. B.	Rochester
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Ginsberg, Harry	Minneapolis
Ginsberg, Wm.	St. Paul
Goblirsch, A. P.	Sleepy Eye
Goeckerman, W. H.	Rochester
Goehrs, H. W.	St. Cloud
Goldberg, I. M.	Minneapolis
Goldberg, S. L.	Rochester
Golden, C. M.	Tyler
Goltz, E. V.	St. Paul
Goodman, C. E.	Virginia
Gosslee, G. L.	Moorhead
Gowan, L. R.	Duluth
Graham, A. S.	Rochester
Graham, David	Duluth
Graham, Robert	Duluth
Graham, R. D.	Duluth
Graham, W. D.	Hanska
Grant, H. W.	St. Paul
Gratzek, F. R.	Minneapolis
Gratzek, Thos.	St. Paul
Grave, Floyd	Minneapolis
Graves, W. N.	Duluth
Grawn, F. A.	Northome
Gray, F. D.	Marshall
Gray, H. K.	Rochester
Green, E. K.	Minneapolis
Greene, C. H.	Rochester
Greene, H. H.	Austin
Greene, W. P.	Minneapolis
Greisheimer, Esther M.	Minneapolis
Grimes, A. E., Jr.	Rochester
Grimes, H. B.	Madelia
Grimes, Marian	Minneapolis
Grinnell, W. B.	Preston
Grise, W. B.	Austin
Grogan, J. S.	Wadena
Gronvall, P. R.	Minneapolis
Groschupf, T. P.	Bemidji
Grose, F. N.	Clarissa
Gullixson, A.	Albert Lea
Gully, R. J.	St. Peter
Gunderson, N. A.	Minneapolis
Gruenhagen, A. P.	St. Paul
Gustafson, H. T.	Minneapolis

Habein, H. C.	Rochester
Haberman, E.	Osakis
Hacking, F. H.	Minneapolis
Haddow, N. W.	Minneapolis
Haessly, S. B.	Faribault
Hagaman, G. K.	St. Paul
Hagen, G. L.	Minneapolis
Hagen, H. O.	New Richland
Hagen, O. E.	Butterfield
Hagen, O. J.	Moorhead
Haggard, G. D.	Minneapolis
Haines, J. H.	Stillwater
Haines, S. F.	Rochester
Hale, D. E.	Rochester
Halgren, H. A.	Watertown
Hall, A. R.	St. Paul
Hall, H. H.	St. Paul
Hall, J. M.	Minneapolis
Hall, S. S.	Minneapolis
Hallberg, C. A.	Minneapolis
Hallenbeck, D. F.	Rochester
Halloran, Walter	Jackson
Halpern, D. J.	Battle Lake
Halpin, J. E.	Rush City
Hamel, A. L.	Minneapolis
Hamilton, A. S.	Minneapolis
Hamlin, G. B.	Minneapolis
Hammermeister, T. F.	New Ulm
Hammes, E. M.	St. Paul
Hammond, A. J.	Minneapolis
Hammond, J. F.	St. Paul
Hand, W. R.	Elbow Lake
Haney, C. L.	Duluth
Hannah, H. B.	Minneapolis
Hansen, C. O.	Minneapolis
Hansen, Erling	Minneapolis
Hansen, Olga S.	Minneapolis
Hanson, A. M.	Faribault
Hanson, E. C.	Park Rapids
Hanson, H. J.	Minneapolis
Hanson, H. V.	St. Paul
Hanson, W. A.	Minneapolis
Happe, L. J.	Marshall
Hare, E. R.	Minneapolis
Harmeier, J. W.	Rochester
Harmon, G. E.	St. Paul
Harper, F. R.	Rochester
Harriman, L.	Howard Lake
Harrington, C. D.	Minneapolis
Harrington, F. E.	Minneapolis
Harrington, S. W.	Rochester
Harris, C. N.	Nashwauk
Harris, M. T.	Rochester
Harrison, P. W.	Rochester
Hart, W. E.	Monticello
Hartfiel, W. F.	St. Paul
Hartley, E. C., Jr.	St. Paul
Hartman, H. R.	Rochester
Hartzell, T. B.	Minneapolis
Haskell, A. D.	Alexandria
Hassett, R. G.	Mankato
Hastings, D. R.	Minneapolis
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hauge, M. I.	Clarkfield
Hauge, M. M.	Clarkfield
Hauser, V. P.	St. Paul
Havens, F. Z.	Rochester
Havens, J. G. W.	Austin
Haverfield, A. R.	Minneapolis
Hawkins, V. J.	St. Paul
Hawkinson, J. P.	Crosby
Hawkinson, L. F.	Brainerd
Hawkinson, R. P.	Minneapolis
Hayes, J. M.	Minneapolis
Hayes, M. F.	Nashwauk
Haynes, A. L.	Faribault
Haynes, M. H.	Menahga
Hazen, S. F.	Rochester
Head, Douglas P.	Minneapolis
Head, G. D.	Minneapolis
Healy, R. T.	Pierz
Hearn, W. O.	Minneapolis
Heath, A. C.	St. Paul
Heazlett, W. A.	Rochester
Hebeisen, M. B.	Carver
Hebert, W. H. J.	Rochester
Heck, F. J.	Rochester
Heck, W. W.	St. Paul
Hedback, A. E.	Minneapolis
Hedberg, G. A.	Nopeming
Hedenstrom, F. G.	St. Paul
Hedenstrom, L. H.	Cambridge
Hegge, O. H.	Austin
Hegge, R. S.	Austin
Heiberg, E. A.	Fergus Falls
Heim, R. R.	Minneapolis
Heimark, J. H.	Moorhead
Heimark, J. J.	Fairmont
Heimark, O. E.	Duluth
Heise, W. F. C.	Winona
Helk, H. H.	Minneapolis
Helland, G. M.	Spring Grove
Helland, J. W.	Spring Grove
Helmholz, H. F.	Rochester
Hempstead, B. E.	Rochester
Hemstead, Werner	St. Cloud
Hench, P. S.	Rochester
Henderson, A. J.	Kiester
Henderson, M. S.	Rochester
Hendrickson, J. F.	Minneapolis
Hendrickson, R. R.	Wadena
Hengstler, W. H.	St. Paul
Henney, W. H.	McIntosh
Henry, C. E.	Minneapolis
Henry, M. O.	Minneapolis
Hensel, C. N.	St. Paul
Henslin, A. E.	LeRoy
Herbert, W. L.	Maynard
Herbolsheimer, A. J.	Minneapolis
Herbst, W. P.	Minneapolis
Herman, A. L.	Minneapolis
Herrmann, E. T.	St. Paul
Hermanson, P. E.	Hendricks
Hertel, G. E.	Austin
Heseltine, V. G.	Taylors Falls
Hesselgrave, S. S.	St. Paul
Hewitt, Edith S.	Rochester
Hewson, W. J.	Stillwater
Heyerdale, O. C.	Rochester
Hiebert, J. P.	Minneapolis
Hielscher, J. A.	Mankato
Higbee, P. A.	Minneapolis
Higgins, J. H.	Minneapolis
Hilding, Anderson C.	Rochester
Hilger, A. W.	St. Paul
Hilger, D. D.	St. Paul
Hilger, L. A.	St. Paul
Hill, Eleanor J.	Minneapolis
Hill, F. E.	Duluth
Hilton, J. M.	Rochester
Hines, E. A., Jr.	Rochester
Hiniker, L. P.	St. Paul
Hiniker, Peter J.	Le Sueur
Hirschboeck, F. J.	Duluth
Hirschfelder, A. D.	Minneapolis
Hirschfield, Adolph	Minneapolis
Hirschfield, M. S.	Duluth
Hirshfield, F. R.	Minneapolis
Hitchings, W. S.	Lakefield
Hoaglund, A. W.	Minneapolis
Hobbs, C. A.	Minneapolis
Hochfilzer, J. J.	St. Paul
Hodapp, R. J.	Willmar
Hodge, S. V.	Minneapolis
Hodgson, H. H.	Crookston
Hoerner, M. T.	Rochester
Hoff, Alfred	St. Paul
Hoffman, M. H.	St. Paul
Hoidale, A. D.	Tracy
Hoiland, A. S.	Minneapolis
Holbrook, J. S.	Mankato
Holcomb, J. T.	St. Paul
Holcomb, O. W.	St. Paul
Holderman, J. W.	Duluth
Holdridge, George	Foley
Holen, T.*	Minneapolis
Holl, P. M.	Minneapolis
Hollands, W. H.	Fisher
Holm, H. H.	Glencoe
Holmberg, L. J.	Canby
Holmes, A. E.	Rush City
Holmstrom, C. H.	Warren
Holst, C. F.	Little Falls
Holst, J. B.	Little Falls
Holt, J. E.	St. Paul
Holt, W. B.	Minneapolis
Holte, Halvor	Crookston
Holtan, Theodore	Waterville
Horton, B. T.	Rochester
Hovde, Rolf	Winthrop
Houkom, Bjarne	Fergus Falls
House, Z. E.	Cass Lake
Houston, C. A.	Park Rapids
Howard, M. I.	Mankato
Howard, W. H.	Minneapolis
Howard, W. S.	St. Paul
Howell, W. L.	Rochester
Hubin, E. G.	Deerwood
Huenekens, E. J.	Minneapolis
Huffington, H. L.	Mankato
Hughes, L. D.	Minneapolis
Hullsiek, R. B.	St. Paul
Hultkrans, J. C.	St. Paul

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*Deceased.

Hultkrans, R. E.	Minneapolis
Humphrey, E. W.	Moorhead
Humphrey, W. R.	Stillwater
Hunt, F. N.	Fairmont
Hunt, H. E.	St. Paul
Hunt, R. C.	Fairmont
Hunte, A. F.	Bylos, Arizona
Hurd, Annah	Minneapolis
Hurt, H. H.	Rochester
Huseby, H. W.	Floodwood
Hutchinson, C. J.	Minneapolis
Hutchinson, Henry	New London
Huxley, F. R.	Faribault
Hyde, T. L.	Rochester
Hymes, Charles	Minneapolis
Hynes, James	Minneapolis
Hynes, J. E.	Minneapolis

Iber, F. C.	Rochester
Ide, A. W.	St. Paul
Ikeda, Kano	St. Paul
Imes, P. R.	Rochester
Irvine, H. G.	Minneapolis
Irwin, Alexander F.	Minneapolis

Jackson, C. M.	Minneapolis
Jacobs, A. C.	Elmore
Jacobs, J. C.	Willmar
Jacobson, Clarence	Chisholm
Jacquot, G. L.	Marshall
Jamieson, Earl	Walnut Grove
Jamieson, E. F.	Brainerd
Jennings, F. L.	Oak Terrace
Jennings, Mary H.	Minneapolis
Jensen, A. H.	Hutchinson
Jensen, Harry	Minneapolis
Jensen, H. H.	Atwater
Jensen, M. J.	Minneapolis
Jensen, T. J.	Duluth
Johnson, A. B.	Minneapolis
Johnson, A. E.	Red Wing
Johnson, A. E.	Minneapolis
Johnson, Asa M.	St. Paul
Johnson, C. E.	St. Paul
Johnson, C. M.	Dawson
Johnson, Ellsworth	Rochester
Johnson, E. W.	Bemidji
Johnson, H. C.	St. Paul
Johnson, H. M.	Dawson
Johnson, H. P.	Fairmont
Johnson, H. W. E.	Rochester
Johnson, J. A.	St. Paul
Johnson, James A.	Minneapolis
Johnson, Julius	Minneapolis
Johnson, N. A.	Minneapolis
Johnson, Norman	Minneapolis
Johnson, O. H.	Echo
Johnson, O. V.	Fergus Falls
Johnson, R. A.	Minneapolis
Johnson, Ray G.	St. Paul
Johnson, S. M.	Minneapolis
Johnson, T. H.	St. Paul
Johnson, V. P.	Delano
Johnson, Walfred	Sauk Center
Johnson, W. R.	Rochester
Johnson, W. E.	Morgan
Johnson, Y. T.	Minneapolis
Jones, A. W.	Red Wing
Jones, D. C.	St. Paul
Jones, E. M.	St. Paul
Jones, G. M.	Minneapolis
Jones, H. W.	Minneapolis
Jones, R. N.	St. Cloud
Jordan, L. S.	Granite Falls
Josewich, Alexander	Minneapolis
Josewski, R. J.	Stillwater
Joyce, G. L.	Stewartville
Joyce, G. T.	Rochester
Judd, E. S.	Rochester
Juergens, H. M.	Belle Plaine
Juliar, R. O.	St. Clair

Kaasa, L. J.	Albert Lea
Kadesky, David	St. Paul
Kahala, Arthur	Crookston
Kalinoff, D.	Stillwater
Kamman, G. R.	St. Paul
Kamp, B. A.	Albert Lea
Kannary, E. L.	St. Paul
Kanne, C. W.	Faribault
Karn, B. R.	Ortonville
Kaufman, W. C.	Appleton
Kegaries, D. L.	Rochester
Keith, H. M.	Rochester
Keith, N. M.	Rochester
Kelby, G. M.	Minneapolis
Kelling, L. F.	Lakefield
Kellum, E. L.	Rochester
Kelly, B. W.	Aitkin
Kelly, J. V.	St. Paul
Kelly, P. H.	St. Paul
Kelsey, C. G.	Hinckley
Kemp, A. F.	Mankato
Kemp, M. W.	Fergus Falls
Kendahl, A. M.	Jasper
Kenefick, E. V.	St. Paul
Kennedy, C. C.	Minneapolis
Kennedy, Jane F.	Minneapolis
Kennedy, R. L. J.	Rochester
Kennedy, R. R.	Minneapolis
Kennedy, W. A.	St. Paul
Kenny, H. F.	St. Paul
Kenyon, Paul	Wadena
Kepler, E. J.	Rochester
Kerlan, S. Z.	Aitkin
Kernohan, J. W.	Rochester
Kerschbaumer, Louisa	St. Peter
Kesting, Herman	St. Paul
Keyes, C. R.	Duluth
Keyes, E. D.	Winona
Keyes, J. D.	Winona
Kibbe, O. A.	Minneapolis
Kierland, P. E.	Alexandria
Kiesling, I. H.	Nashwauk
Kilbride, E. A.	Worthington
Kilbride, J. S.	Canby
Kilbourne, A. F.	Rochester
King, E. A.	Minneapolis
King, G. L.	St. Paul
King, H. T.	Minneapolis
King, W. R.	Minneapolis
King, W. S.	Eveleth
King, Z. P.	St. Paul
Kinsella, T. J.	Oak Terrace
Kirk, G. P.	East Grand Forks
Kirklin, B. R.	Rochester
Kirklin, O. L.	Rochester
Kistler, A. J.	Minneapolis
Kistler, A. S.	St. Paul
Kistler, C. M.	Minneapolis
Kittelson, T. N.	Fergus Falls
Klaveness, E.	St. Paul
Klein, Harry	Duluth
Klein, H. N.	St. Paul
Klima, W. W.	Stewart
Kliman, F. E.	Duluth
Knauff, M. K.	St. Paul
Knapp, F. N.	Duluth
Knight, R. R.	Minneapolis
Knight, R. T.	Minneapolis
Koch, J. C.	Minneapolis
Koelsche, G. A.	Rochester
Koepcke, G. M.	Minneapolis
Kohlbry, C. O.	Duluth
Kohler, D. W.	St. Joseph
Kolars, J. J.	Le Center
Koller, H. M.	Minneapolis
Koller, L. R.	Minneapolis
Kolset, C. D.	Sanborn
Kooiker, H. J.	Milaca
Koop, S. H.	Richmond
Kotchevar, F. R.	Eveleth
Kraft, Peter	Duluth
Krantz, C. I.	Duluth
Kremer, Walter J.*	Minneapolis
Kreuzer, T. C.	Owatonna
Kriedt, Daniel	Minneapolis
Kucera, F. J.	Hopkins
Kucera, W. J.	Minneapolis
Kuhlmann, August	Melrose
Kullman, H. J.	Rochester
Kuske, A. W.	Faribault
Kusske, A. L.	New Ulm
Kuth, J. R.	Duluth
Kvitrud, G.	St. Paul

Laird, A. T.	Nopeming
Lajoie, J. M.	Minneapolis
Lamont, J. G.	Nopeming
Lane, Laura A.	Northfield
Langenderfer, F. V.	St. Paul
Langhoff, A. H.	Glencoe
Lannin, J. C.	Mabel
Lapierre, A. P.	Minneapolis
Lapierre, C. A.	Minneapolis
Lapierre, J. T.	Minneapolis
Larsen, C. L.	St. Paul
Larsen, O. O.	Detroit Lakes
Larson, A. L.	Detroit Lakes
Larson, C. M.	Minneapolis
Larson, L. J.	Bagley
Larson, L. M.	Rochester
Larson, L. M.	Oak Terrace
Larson, P. N.	Rochester
Laughlin, J. T.	Grey Eagle
Laurent, A. A.	Minneapolis
La Vake, R. T.	Minneapolis
Lax, M. H.	St. Paul
Lazar, H. L.	Minneapolis
Leahy, Bartholomew	St. Paul
Learmonth, J. R.	Rochester
Leavenworth, R. O.	St. Paul
Leavitt, H. H.	Minneapolis
Lebowske, J. A.	Minneapolis
Leck, C. C.	Austin
Leckband, Norbert	Buhl
Leddy, E. T.	Rochester
Lee, H. M.	Minneapolis
Lee, J. L.	Watertown
Lee, T. G.	Minneapolis
Lee, W. A.	Fergus Falls
Lee, Walter N.	Madison
Leibold, H. H.	Parkers Prairie
Leitch, Archibald	St. Paul
Leitch, N. M.	Warroad
Leggett, Elizabeth Ann	Minneapolis
Leland, H. R.	Minneapolis
Leland, J. T.	Herman
Leland, M. N.	Minneapolis
Lemon, W. S.	Rochester
Lenander, M. E.	St. Peter
Lende, Norman	Faribault
Lendrum, F. C.	Rochester
Lenont, C. B.	Virginia
Leonard, G. J.	St. Paul
Leonard, L. J.	Minneapolis
Leopard, B. A.	Albert Lea
Lepak, F. J.	Duluth
Lepak, J. A.	St. Paul
Lerch, William	Cable, Wis.
Lester, Garra L.	Rochester
Leven, N. L.	Rochester
Levin, Bert	St. Paul
Levine, N. M.	Minneapolis
Lewis, A. J.	Henning
Lewis, C. B.	St. Cloud
Lewis, W. W.	St. Paul
Lexa, F. J.	Lonsdale
Libert, J. N.	St. Cloud
Lichtenstein, H.	Winona
Lick, C. L.	St. Paul
Liedloff, A. G.	Mankato
Liffrig, W. W.	Goodhue
Lillehei, E. J.	Minneapolis
Lillie, H. I.	Rochester
Lillie, W. I.	Rochester
Lima, Ludvig	Montevideo
Lind, C. J.	Minneapolis
Lindahl, M. J.	Winthrop
Lindberg, A. L.	Wheaton
Lindquist, R. H.	Minneapolis
Linner, H. P.	Minneapolis
Linton, W. B.	Minneapolis
Litman, A. B.	Minneapolis
Litman, S. N.	Duluth
Little, W. J.	St. Paul
Litzenberg, J. C.	Minneapolis
Lloyd, H. J.	Mankato
Lochead, D. C.	Rochester
Locken, O. E.	Crookston
Lodmell, E. A.	Sebeka
Logan, A. H.	Rochester
Logan, F. W.	Blue Earth
Logefeil, R. C.	Minneapolis
Lommen, P. A.	Austin
Loney, W. R. R.	Rochester
Long, Jesse	Minneapolis
Loofbourrow, E. H.	Keewatin
Loomis, E. A.	Minneapolis
Love, F. A.	Carlos
Love, J. G.	Rochester
Lowe, E. R.	South St. Paul
Lowe, T. A.	South St. Paul
Lowe, Thomas	Pipestone
Luden, Georgine	Victoria, B. C., Can.
Luedtke, G. H.	Fairmont
Lum, C. E.	Duluth
Lundgren, A. C.	Minneapolis
Lundholm, A. M.	St. Paul
Lundquist, E. F.	Minneapolis
Lundy, J. S.	Rochester
Lynch, M. J.	Minneapolis
Lynde, O. G.	Thief River Falls
Lyon, E. P.	Minneapolis
Lyon, J. D.	Minneapolis
Lysne, Henry	Minneapolis

McBeath, E. C.	New York, N. Y.
McBroom, D. E.	Cambridge
McCarthy, Donald	Minneapolis
McCarthy, W. J.	Madelia
McCarthy, W. R.	St. Paul
McCartney, J. S.	Minneapolis
McCarty, P. D.	Ely
McCarty, W. C.	Rochester
McCaughan, J. M.	Rochester
McClanahan, J. H.	White Bear
McClanahan, T. S.	White Bear
McCloud, C. N.	St. Paul
McComb, C. F.	Duluth
McCoy, Mary K.	Duluth
McCrea, J. M.	Fulda
McCuskey, C. F.	Rochester
McDaniel, Orianna	Minneapolis
McDaniel, S. P.	Mountain Iron
McDonald, A. L.	Duluth
McDonnell, C. H.*	Winona
McDowell, J. P.	St. Cloud
McEachran, A.	Minneapolis

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*Deceased.

McFarland, A. H.	Minneapolis
McGandy, R. F.	Minneapolis
McGeary, G. E.	Minneapolis
McGiffert, E. N.*	Duluth
McGroarity, J. J.	Easton
McGuigan, H. T.	Red Wing
McHaffie, O. L.	Duluth
McHugh, R. F.	Aitkin
McIntire, H. M.	Waseca
McIntyre, George	Minneapolis
McIntyre, J. A.	Owatonna
McIver, B. A.	Lowry
McKaig, C. B.	Pine Island
McKechnie, Wilfred	St. Peter
McKenna, J. K.	Austin
McKeon, James	St. Paul
McKeon, J. O.	Montgomery
McKeon, Owen	St. Paul
McKeown, E. G.	Pipestone
McKinlay, C. A.	Minneapolis
McKinley, J. C.	Minneapolis
McKinney, F. S.	Minneapolis
McLane, Evelyn G.	Sleepy Eye
McLane, W. O.	Sleepy Eye
McLaren, Jennette M.	St. Paul
McLaughlin, E. M.	Winona
McLeod, J. L.	Bovey
McNevin, C. F.	St. Paul
McNutt, J. R.	Duluth
McPheeters, H. O.	Minneapolis
McQuiston, J. S.	Rochester

MacDonald, A. E.	Minneapolis
MacDonald, D. A.	Minneapolis
MacDonald, I. C.	Minneapolis
Macfarlane, P. H.	Chisholm
Mach, F. B.	Minneapolis
Macklin, W. E., Jr.	Litchfield
Macnie, J. S.	Minneapolis
MacRae, G. C.	Duluth
Madden, J. F.	St. Paul
Maertz, W. F.	New Prague
Magath, T. B.	Rochester
Magee, H. R.	Rochester
Magie, W. H.	Duluth
Magiera, Estelle A.	Minneapolis
Magney, F. H.	Duluth
Mahowald, A.	Albany
Major, S. G.	Rochester
Maland, C. O.	Minneapolis
Manley, J. R.	Duluth
Manley, L. V.	Albert Lea
Mann, A. T.	Minneapolis
Mann, F. C.	Rochester
Manson, F. M.	Worthington
Marcley, W. J.	Minneapolis
Marcum, E. H.	Bemidji
Mariette, E. S.	Oak Terrace
Mark, D. B.	Minneapolis
Mark, Hilbert	Ah-Gwah-Ching
Marsh, H. L.	Eveleth
Martin, E. T.	Duluth
Martin, T. P.	Arlington
Martin, W. C.	Duluth
Martin, W. J., Jr.	Rochester
Martinson, C. J.	Wayzata
Matchan, G. R.	Minneapolis
Martineau, J. L.	St. Paul
Massey, B. D.	Rochester
Masson, D. M.	Rochester
Masson, J. C.	Rochester
Matthews, Justus	Minneapolis
Mattill, P. M.	Oak Terrace
Mattison, P. A.	Winona
Mattson, C. H.	St. Paul
Maxeiner, S. R.	Minneapolis
May, W. H.	Minneapolis
Mayland, M. L.	Faribault
Mayne, R. M.	Duluth
Mayo, C. H.	Rochester
Mayo, C. W.	Rochester
Mayo, J. G.	Rochester
Mayo, W. J.	Rochester
Maytum, C. K.	Rochester
Meade, J. R.	Rochester
Meierding, W. A.	New Ulm
Meighen, J. W.	Ulen
Meinert, A. E.	Winona
Meland, E. L.	Rochester
Melby, Benedik	Blooming Prairie
Mellby, O. F.	Thief River Falls
Melzer, G. R.	Lyle
Mercer, S. R.	Rochester
Mercil, W. F.	Crookston
Merkert, C. E.	Minneapolis
Merkert, G. L.	Minneapolis
Merriman, L. L.	Duluth
Mesker, G. H.	Olivia
Messick, J. M.	Rochester
Meyer, A. A.	Melrose
Meyer, E. L.	Minneapolis
Meyer, P. F.	Faribault
Meyerding, E. A.	St. Paul

Meyerding, H. W.	Rochester
Michael, J. C.	Minneapolis
Michelson, H. E.	Minneapolis
Michie, T. C.	Rochester
Miller, H. A.	Fairmont
Miller, V. I.	Mankato
Miller, W. A.	New York Mills
Millet, R. F.	Rochester
Mills, J. L.	Winnebago
Mills, S. D.	Rochester
Milton, J. S.	Minneapolis
Miners, G. A.	Deer River
Mitchell, A. B.	Lansing, Mich.
Mitchell, R. S.	Grand Meadow
Moe, R. J.	Duluth
Moe, Thomas	Moose Lake
Moen, J. K., Jr.	Minneapolis
Moench, Mary	Rochester
Moersch, F. P.	Rochester
Moersch, H. J.	Rochester
Moga, J. A.	St. Paul
Mogilner, S. N.	St. Paul
Mohardt, J. H.	Rochester
Moir, W. W.	Minneapolis
Molander, H. A.	St. Paul
Monroe, P. B.	Two Harbors
Montgomery, Jimmie Ethel	Rochester
Montgomery, Hamilton	Rochester
Mooney, L. P.	Marble
Moorhead, M. B.	Minneapolis
Moquin, Marie A.	St. Paul
Moran, T. R.	St. Paul
More, C. W.	Eveleth
Moren, Edwin	Minneapolis
Morey, J. B.	Rochester
Morgan, S. F.	Rochester
Moriarty, Cecile R.	Minneapolis
Mork, B. O.	Worthington
Morley, G. A.	Crookston
Morrison, A. W.	Minneapolis
Morrissey, F. B.	St. Paul
Morrow, J. J.	Austin
Morse, M. P.	LeRoy
Morsman, L. W.	Hibbing
Morss, C. R.	Zumbrota
Mortenson, N. G.	St. Paul
Morton, S. A.	Milwaukee, Wis.
Moses, Joseph, Jr.	Northfield
Moss, Myer N.	St. Paul
Moyer, R. E.	Bemidji
Moynihan, A. F.	Sauk Center
Moynihan, T. J.	St. Paul
Mroz, R. J.	Rochester
Mueller, S. C.	Rochester
Muller, R. T.	St. Paul
Murdoch, J. M.	Faribault
Murphy, I. J.	Minneapolis
Murray, D. D.*	Duluth
Murray, R. A.	Duluth
Murray, S. E.	Rochester
Mussey, R. D.	Rochester
Myers, J. A.	Minneapolis
Myers, Thomas	St. Paul

Nagel, H. D.	Waconia
Naegeli, A. E.	St. Paul
Naegeli, Frank	Fergus Falls
Nass, H. A.	Mabel
Nathanson, M. H.	Minneapolis
Nauth, W. W.	Winona
Neher, F. H.	St. Paul
Nehring, J. P.	Preston
Nelson, C. P.	Minneapolis
Nelson, E. H.	Chisholm
Nelson, E. J.	Owatonna
Nelson, Harvey	Minneapolis
Nelson, H. E.	Crookston
Nelson, H. S.	Minneapolis
Nelson, L. A.	St. Paul
Nelson, M. S.	Granite Falls
Nelson, Nesmith	Brainerd
Nelson, O. E.	Minneapolis
Nelson, O. N.	Battle Lake
Nelson, R. L.	Duluth
Nelson, W. I.	Underwood
Nelson, W. L.	Rochester
Nethercott, E. G.	Pine City
Neumann, C. A.	Winona
New, G. B.	Rochester
Newhart, Horace	Minneapolis
Nicholson, M. A.	Duluth
Nickerson, W. S.	Faribault
Ninneman, N. N.	Silver Lake
Nippert, H. T.	St. Paul
Noble, J. F.	St. Paul
Nordin, C. G.	St. Paul
Nordin, G. T.	Minneapolis
Norrgard, H. T.	Milaca
Norris, G. H.	Annandale
Nordland, Martin	Minneapolis
Norman, J. F.	Crookston
Norris, E. H.	St. Paul
Noth, H. W.	Minneapolis
Novak, E. E.	New Prague
Nuessle, W. G.	Springfield
Nusbaum, D. H.	Jackson
Nutting, R. E.	Duluth
Nye, Katherine A.	St. Paul
Nye, Lillian L.	St. Paul
Nystrom, Ruth	Minneapolis

Oberg, C. M.	Minneapolis
O'Brien, H. J.*	St. Paul
O'Brien, W. A.	Minneapolis
O'Connor, D. C.	Eden Valley
O'Connor, L. J.	St. Paul
O'Donnell, D. M.	Ortonville
O'Donnell, J. E.	Minneapolis
Oerting, Harry	St. Paul
Offutt, Susan R.	Rochester
Ogden, Warner	St. Paul
Ohage, Justus, Jr.	St. Paul
Ohage, Justus	St. Paul
O'Hara, J. J.*	Janesville
Ohlinger, L. B.	Chicago, Ill.
Ohnstad, J. L.	McIntosh
O'Leary, P. A.	Rochester
Oliver, C. I.	Graceville
Oliver, I. L.	Graceville
Olson, A. E.	Duluth
Olson, Archibald	Hendricks
Olson, C. A.	St. Paul
Olson, C. J.	Belle Plaine
Olson, E. A.	Pine Island
Olson, F. A.	Minneapolis
Olson, J. W.	Cokato
Olson, O. A.	Minneapolis
Olson, R. G.	Minneapolis
Olson, W. P.	Gaylord
Onsgard, L. Kenneth	Houston
Onsgard, L. K.	Houston
Oppegaard, C. L.	Crookston
Oppegaard, M. O.	Crookston
Oredson, O. A.	Duluth
O'Reilley, B. E.	St. Paul
Ormond, Douglas	Waconia
Osborne, Lida	Mankato
Osburn, B. F.	International Falls
Ostergren, E. W.	St. Paul
Otto, H. C.	Frazee
Overend, K. V.	Hallock
Overton, L. M.	Rochester
Owre, Oscar	Minneapolis

Page, C. V.	St. Paul
Page, R. L.	St. Charles
Palmer, C. F.	Albert Lea
Palmer, R. N.*	Lanesboro
Palmer, W. L.	Albert Lea
Paradis, W. G.	Crookston
Parker, H. L.	Rochester
Parker, O. W.	Ely
Parks, A. H.	Minneapolis
Parson, L. R.	Elbow Lake
Parsons, J. G.	Crookston
Passer, A. A.	Olivia
Pattee, G. L.	Rochester
Patterson, W. E.	Minneapolis
Patterson, W. E.	Westbrook
Patterson, W. L.	Fergus Falls
Patmos, Martin	Rochester
Paulsen, E. L.	Minneapolis
Paulson, T. S.	Fergus Falls
Pearce, N. O.	Minneapolis
Pearson, F. R.	St. Paul
Pearson, W. T.	Finlayson
Pedersen, A. H.	St. Paul
Pederson, Harold	Minneapolis
Pederson, R. M.	Minneapolis
Pemberton, J. de J.	Rochester
Penhall, F. W.	Morton
Pennie, D. F.	Duluth
Peppard, T. A.	Minneapolis
Perry, C. G.	St. Paul
Perry, R. St. J.	Minneapolis
Persons, C. E.	Marshall
Pertl, A. L.	Windom
Petersen, J. R.	Minneapolis
Petersen, Thorvald	Minneapolis
Peterson, A. A.	Mora
Peterson, H. W.	Minneapolis
Peterson, J. A.	Red Wing
Peterson, M. C.	St. Peter
Peterson, O. H.	Minneapolis
Peterson, O. L.	Cokato
Peterson, R. A.	Vesta
Peterson, V. L.	Rochester
Peterson, V. N.	St. Paul
Peterson, W. C.	Minneapolis
Petit, L. J.	Minneapolis
Petraborg, H. T.	Stillwater
Pettit, C. W.	Minneapolis
Pfunder, M. C.	Minneapolis
Phelps, A. G.	St. Paul
Phelps, K. A.	Minneapolis
Phillips, A. E.	Delano

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*Deceased.

Phillips, J. R.	Rochester
Phillips, W. H.	Jordan
Pierce, C. H.	Wadena
Pierson, Claude M.	Wheaton
Piper, M. C.	Rochester
Piper, W. A.	Mountain Lake
Platou, E. S.	Minneapolis
Platt, F. B.	Battle Lake
Plondke, F. J.	St. Paul
Plonske, C. J.	Faribault
Plummer, H. S.	Rochester
Plummer, W. A.	Rochester
Poirier, J. A.	Forest Lake
Pollard, D. W.	Minneapolis
Pollock, L. W.	Rochester
Popp, W. C.	Rochester
Poppe, F. H.	Minneapolis
Portmann, W. C.	Jackson
Power, J. E.	Duluth
Prangen, A. D.	Rochester
Pratt, F. J.	Minneapolis
Pratt, J. A.	Minneapolis
Preine, I. A.	Minneapolis
Prendergast, H. J.	St. Paul
Prickman, L. E.	Rochester
Priestley, J. B.	Rochester
Priestley, J. T.	Rochester
Prim, J. A.	Minneapolis
Pritchard, D. B.*	Winona
Proshek, C. E.	Minneapolis

Quade, R. H.	Rochester
Quinby, T. F.	Minneapolis
Quist, H. W.	Minneapolis

Raadquist, C. S.	Hibbing
Radabaugh. R. C.	Hastings
Raihala, John	Virginia
Rains, J. M.	Willmar
Raiter, F. W. S.	Cloquet
Raiter, R. F.	Cloquet
Ramsey, W. R.	St. Paul
Randall, A. M.	Ashby
Randall, L. M.	Rochester
Rankin, F. W.	Rochester
Ransom, M. L.	Hancock
Rathbun, A. M.	Rice
Rathbun, C. A.	St. Cloud
Rebman, E. C.	Austin
Reed, C. A.	Minneapolis
Rees, S. P.*	Minneapolis
Regnier, E. A.	Minneapolis
Reineke, G. F.	New Ulm
Reiter, H. W.	Shakopee
Rentschler, E. B.	Rochester
Replogle, W. H.	Wabasha
Reynolds, J. S.	Minneapolis
Richards, E. T. F.	St. Paul
Richards, W. B.	St. Cloud
Richardson, Fred S.	Minneapolis
Richardson, H. E.	St. Paul
Richardson, W. J.	Fairmont
Richdorf, L. F.	Minneapolis
Ridgway, Alexander	South Haven
Ridgway, A. M.	Annandale
Ridgway, Florence	Minneapolis
Rieniets, J. H.	Rochester
Rigler, L. G.	Minneapolis
Rimer, E. W.	Breckenridge
Ringle, O. F.	Walker
Rishmiller, J. H.	Minneapolis
Risser, E. D.	Winona
Ritchie, H. P.	St. Paul
Rivers, A. B.	Rochester
Rixford, E. L.	Rochester
Rizer, R. I.	Minneapolis
Roan, C. M.	Minneapolis
Rohb, E. F.	Minneapolis
Robbins, C. P.	Winona
Roberts, L. M.	Little Falls
Roberts, T. S.	Minneapolis
Roberts, W. B.	Minneapolis
Rohertson, A. W.*	Litchfield
Robertson, H. E.	Rochester
Robertson, J. B.	Cottonwood
Robertson, P. A.	Austin
Robilliard, C. M.	Faribault
Robilliard, W. H.*	Faribault
Robins, C. R., Jr.	Rochester
Robinson, J. M.	Duluth
Robinson, L. W.	Rochester
Robitshek, E. C.	Minneapolis
Rochford, W. E.	Minneapolis
Rodda, F. C.	Minneapolis
Rodgers, C. L.	Minneapolis
Roehlke, A. B.	Elk River
Rogers, J. T.	St. Paul
Rogin, J. R.	Rochester
Roholt, C. L.	Waverly
Rood, D. C.	Duluth
Rose, J. T.	Lakefield
Rosen, S.	Minneapolis
Rosenberger, H. P.	St. Paul
Rosenfield, A. B.	Pequot
Rosenholtz, Burton	St. Paul
Rosenthal, Robert	St. Paul
Rosenow, E. C.	Rochester
Rosenwald, R. M.	Minneapolis
Ross, W. P.	Worthington
Rothenburg, J. C.	Springfield
Rothrock, J. L.	St. Paul
Rothschild, H. J.	St. Paul
Rosseau, Victor	Maple Lake
Roust, H. A.	Montevideo
Rowe, O. W.	Duluth
Rowe, W. H.	Minneapolis
Rowles, E. K.	Coleraine
Rowntree, L. G.	Rochester
Roy, J. A.	Red Lake Falls
Roy, Philemon	St. Paul
Rucker, C. W.	Minneapolis
Rucker, W. H.	Minneapolis
Rud, N. E.	Minneapolis
Rudell, G. L.	Minneapolis
Rudie, C. N.	Kenyon
Rudie, P. S.	Duluth
Ruffin, Willcox	Rochester
Ruhberg, G. N.	St. Paul
Rumpf, C. W.	Faribault
Rumpf, W. H.	Faribault
Russeth, A. N.	Minneapolis
Rutherford, W. C.	St. Paul
Rutledge, L. H.	Detroit Lakes
Ryan, J. J.	St. Paul
Ryan, M. E.	St. Paul
Ryan, W. J.	Duluth
Rynearson, E. H.	Rochester

Saarf, O. E.	Baudette
Sach-Rowitz, Alvin	McGregor
Sadler, W. P.	Minneapolis
Saffert, C. A.	New Ulm
Sahr, W. G.	Hutchinson
St. Cyr, K. J.	Osseo
Saliterman, B. I.	Janesville
Salt, C. G.	Minneapolis
Samson, E. R.	Chisholm
Sanderson, E. T.	Minneota
Sanford, A. H.	Rochester
Satersmoen, Theo.	Pelican Rapids
Sather, Allen	Fosston
Satterlund, Victor	St. Paul
Satterlee, H. W.	Lewiston
Savage, F. J.	St. Paul
Sawatzky, W. A.	Minneapolis
Schaaf, F. H. K.	Minneapolis
Schaefer, J. F.	Owatonna
Schaefer, S.	Winona
Schaefer, W. G.	Minneapolis
Schatz, F. J.	St. Cloud
Scheldrup, N. H.	Minneapolis
Scherer, C. A.	Duluth
Scherer, L. R.	Rochester
Scherer, R. G.	Rochester
Schimelpfenig, G. T.	Chaska
Schlesselman, George	Anoka
Schlesselman, J. T.	Mankato
Schmidt, Geo. F.	Minneapolis
Schmidt, P. A.	Good Thunder
Schmitt, A. F.	Minneapolis
Schmitt, S. C.	Minneapolis
Schneider, H. A.	Jordan
Schoch, J. L.	New Ulm
Schoch, R. B.	St. Paul
Schons, E.	St. Paul
Schoofs, G. E.	North Branch
Schottler, M. E.	Minneapolis
Schroder, C. H.	Duluth
Schuldt, F. C.	St. Paul
Schultz, J. A.	Albert Lea
Schulze, A. G.	St. Paul
Schussler, O. F.	Minneapolis
Schutz, E. S.	Mountain Lake
Schwartz, V. J.	Minneapolis
Schwyzer, Arnold	St. Paul
Schwyzer, Gustav	Minneapolis
Schwyzer, R.	Minneapolis
Scofield, C. L.	Benson
Scott, F. H.	Minneapolis
Seaberg, J. A.	Minneapolis
Seashore, D. E.	Duluth
Seashore, Gilbert	Minneapolis
Seeley, I. F.	Northfield
Seham, Max	Minneapolis
Seifert, O. J.	New Ulm
Selleseth, Iver	Minneapolis
Senkler, G. E.	St. Paul
Senn, E. W.	Owatonna
Serkland, J. C.	Rothsay
Serrurier, L. R.	Rochester
Sessions, J. C.	Minneapolis
Setzer, H. J.	St. Paul
Shaleen, A. W.	Hallock
Shane, J. H.	Rochester
Shannon, S. S.	Crosby
Shannon, W. R.	St. Paul
Shapiro, E. Z.	Duluth
Shapiro, M. J.	Minneapolis
Shaw, A. W.	Buhl
Shedlov, A.	Fosston
Sheedy, C. L.	Austin
Sheldon, W. D.	Rochester
Shelland, J. T.	Ada
Shellman, J. L.	St. Paul
Shelver, H. J.	Ortonville
Sheppard, Fred	Hutchinson
Sheppard, P. E.	Hutchinson
Sherman, C. H.	Bayport
Sherman, C. L.	Luverne
Sherwood, G. E.	Kimball
Shillington, M. A.	St. Paul
Short, Jacob	St. Paul
Shrader, J. S.	Springfield
Simison, C. W.	Hawley
Simon, B. F.	St. Paul
Simons, B. H.	Chaska
Simons, E. J.	Swanville
Simons, Jalmar	Minneapolis
Simpson, E. D.	Minneapolis
Simpson, J. D.*	Minneapolis
Sinamark, Andrew	Hibbing
Singer, B. J.	St. Paul
Siperstein, D. M.	Minneapolis
Sisler, C. E.	Grand Rapids
Sitar, R. F.	Minneapolis
Sivertsen, Ivar	Minneapolis
Skinner, H. O.	St. Paul
Slater, S. A.	Worthington
Slocumb, C. H.	Rochester
Slocumb, J. A.	Plainview
Slocumb, Maude S.	Minneapolis
Slyfield, F. F.	Duluth
Smallwood, J. T.	Worthington
Smersh, J. F.	Owatonna
Smith, A. E.	Minneapolis
Smith, A. M.	Thief River Falls
Smith, A. M.	Minneapolis
Smith, B. A.	Crosby
Smith, B. F.	Willmar
Smith, C. M.	Duluth
Smith, E. H.	Bemidji
Smith, E. K.	Duluth
Smith, F. L.	Rochester
Smith, Harry L.	Rochester
Smith, H. R.	Minneapolis
Smith, L. G.	Montevideo
Smith, M. W.	Red Wing
Smith, N. D.	Rochester
Smith, N. M.	Minneapolis
Smith, P. A.	Faribault
Smith, W. R.	Grand Marais
Snell, A. M.	Rochester
Snyder, G. W.	St. Paul
Soderlind, R. T.	Minneapolis
Sogge, L.	Windom
Sohlberg, Olof	St. Paul
Sohmer, A. E.	Mankato
Soine, T. S.	Barnesville
Solhaug, S. B.	Minneapolis
Sommer, A. W.	Elmore
Souster, B. B.	St. Paul
Spicer, F. W.	Duluth
Spooner, A. D.	Rochester
Sprafka, J. M.	St. Paul
Sprague, P. H.	Rochester
Spratt, C. N.	Minneapolis
Stacy, L. J.	Rochester
Stafne, W. A.	Rochester
Stangl, Fred	St. Cloud
Stanley, C. R.	Worthington
Stark, W. B.	Rochester
Starkey, T. A.	Rochester
St. Clair, G. G.	Duluth
Steffens, L. A.	Red Wing
Steinberg, C. L.	St. Paul
Steiner, I. W.	Winona
Stelter, Lloyd A.	Minneapolis
Stemsrud, A. A.*	Dawson
Stenstrom, Annette T.	Minneapolis
Stephan, E. L.	Hinckley
Stephenson, G. W.	Rochester
Sterner, E. G.	St. Paul
Sterner, O. W.	St. Paul
Stevens, F. A.	Lake Elmo
Stevens, George	Byron
Steward, J. A.	Rochester
Stewart, A. B.	Owatonna
Stewart, Alexander	St. Paul
Stewart, C. A.	Minneapolis
Stewart, Gwendolyn	Faribault
Stewart, R. I.	Minneapolis
Stickney, C. A.	St. Cloud
Stierle, Adolph, Jr.	St. Paul
Stiles, Angie G.	Northfield
Stillwell, W. C.	Mankato
Stinnette, S. E.	St. Paul
Stolpestad, H. L.	St. Paul
Stomel, Joseph	Minneapolis
Strachauer, A. C.	Minneapolis

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*Deceased.

Strand, E. V.	Bayport
Strathern, F. P.	St. Peter
Strathern, M. L.	Gilbert
Stratte, A. K.	Pine City
Stratte, H. C.	Windom
Strobel, W. G.	Duluth
Strout, E. S.	Minneapolis
Stryker, W. B.	Plainview
Stuck, W. G.	Rochester
Stuhler, L. G.	Rochester
Stuhr, J. W.	Stillwater
Sturre, J. R.	Minneapolis
Stuurmanns, S. H.	Erskine
Sukeforth, L. A.	Duluth
Sundt, M.	Minneapolis
Sutherland, C. G.	Rochester
Sutherland, H. N.	Ely
Sutton, C. S.	St. Cloud
Sutton, L. F.	Mazeppa
Swanson, Cephas	Minneapolis
Swanson, E. O.	St. Paul
Swanson, J. A.	St. Paul
Swanson, R. E.	Minneapolis
Swart, H. A.	Rochester
Swedenburg, A. W.	Thief River Falls
Sweetman, R. H.	Sauk Center
Sweetser, H. B.	Minneapolis
Sweetser, H. B., Jr.	Minneapolis
Sweetser, Theodore	Minneapolis
Sweitzer, S. E.	Minneapolis
Swendseen, C. G.	Minneapolis
Swendson, J. J.	St. Paul
Swennes, O. S.	Wahkon
Swenson, A. O.	Duluth
Swenson, Charles	Braham
Swenson, O. J.	Waseca
Swezey, B. F.	Buffalo

Taft, J. O.	Minneapolis
Tangen, G. M.	Canby
Tanner, A. C.	Minneapolis
Tanquist, E. J.	Alexandria
Tavenner, L. J.	Waseca
Taylor, C. W.	Duluth
Taylor, H. L.*	St. Paul
Taylor, Rood	Minneapolis
Taylor, W. J.	Pipestone
Teisberg, C. B.	St. Paul
Telford, V. J.	Litchfield
Ternstrom, O. H.	Minneapolis
Thabes, J. A., Sr.	Brainerd
Thiessen, N. W.	Rochester
Thomas, G. E.	Minneapolis
Thomas, G. H.	Minneapolis
Thomas, G. J.	Minneapolis
Thompson, Albert	St. James
Thompson, Arthur	Raymond
Thompson, G. J.	Rochester
Thompson, H. H.	Minneapolis
Thompson, V. C.	Marine-on-St. Croix
Thordarson, Theo.	Minneota
Thornby, H. J.	Moorhead
Thornton, H. C.	Rochester
Thorsness, E. T.	Rochester
Thorson, E. O.	Luverne
Thorson, O. P.	Northfield
Thysell, F. A.	Moorhead
Tibbetts, M. H.	Duluth
Tierney, C. M.	Harmony
Tilderquist, D. L.	Duluth
Tingdale, A. C.	Minneapolis
Tofte, Josephine	Dawson
Tovell, R. M.	Rochester
Traeger, C. A.	Faribault
Traxler, F. J.	Henderson
Tregilgas, H. R.	South St. Paul
Trueman, H. S.	Minneapolis
Truog, C. P.	Lindstrom
Trutna, T. J.	Silver Lake
Turnbull, Robert	Fosston
Tunstead, H. J.	Minneapolis
Tuohy, E. L.	Duluth
Turnacliff, D. D.	Minneapolis
Tweedy, G. J.	Winona
Tyrrell, C. C.	Minneapolis
Tyvand, R. E.	Rochester

Ude, W. H.	Minneapolis
Ulrich, H. L.	Minneapolis
Undine, C. A.	Minneapolis
Urberg, S. E.	Duluth
Urner, J. A.	Minneapolis

Vaaler, T.	Cannon Falls
Vadheim, A. L.	Tyler
Vail, J. B.	Henning
Valentine, W. H.	Tracy
Van Meier, Henry	Stillwater
Van Slyke, C. A.	St. Paul
Van Valkenburg, B. F.	Long Prairie
Van Valkenburg, F. W.	Long Prairie
Vanzant, Frances R.	Rochester
Vaughan, V. M.	Truman
Veirs, Dean	St. Paul
Veirs, Ruby S.	St. Paul
Vercellini, C. E.	Duluth
Vezina, J. C.	Mapleton
Vik, A. E.	Minneapolis
Vik, Melvin	Onamia
Vinson, P. P.	Rochester
Vogel, J. H.	New Ulm
Vogtel, M. A.	Minneapolis
Voldeng, K. E.	Rochester
Von der Weyer, Wm.	St. Paul
Voris, H. C.	Rochester
Voyer, E. O.	Minneapolis
Vrooman, F. E.	St. Francis

Waas, C. W.	St. Paul
Wagener, H. P.	Rochester
Wahlquist, H. F.	Minneapolis
Wakefield, E. G.	Rochester
Waldron, C. W.	Minneapolis
Waldron, G. W.	Rochester
Walker, G. H.	Winona
Walker, M. A.	Rochester
Wall, C. R.	Minneapolis
Waller, J. D.	Wilmont
Waller, L. M.	Rochester
Walters, Waltman	Rochester
Wangensteen, O. H.	Minneapolis
Wanous, E. Z.	Minneapolis
Ward, A. W.	Minneapolis
Ward, P. A.	Minneapolis
Warham, T. T.	Minneapolis
Warnock, R. W.	St. Paul
Warren, E. L.	St. Paul
Warren, F. S.	Faribault
Watkins, C. H.	Rochester
Watson, F. G.	Worthington
Watson, J. A.	Minneapolis
Watson, J. D.	Holdingford
Watson, J. R.	Rochester
Watson, N. M.	Red Lake Falls
Watson, Sydney	Worthington
Wattam, G. S.	Warren
Webb, R. C.	Minneapolis
Webber, E. E.	Duluth
Webber, F. L.	St. Paul
Weber, H. M.	Rochester
Webster, W. W.	Rochester
Weir, J. F.	Rochester
Weiser, G. B.	New Ulm
Weisman, S. A.	Minneapolis
Welch, M. C.	St. Paul
Wellbrock, W. L. A.	Rochester
Wellcome, J. W. B.	Sleepy Eye
Welles, H. J.	Minneapolis
Welsh, A. L.	Rochester
Wenner, W. T.	St. Cloud
Wentworth, A. J.	Mankato
Werner, O. S.	Cambridge
West, E. J.	Duluth
Westby, Magnus	Madison
Westby, Nels	Madison
Westerman, A. E.	Montgomery
Westerman, F. C.	Montgomery
Wethal, A. G.	Minneapolis
Wetherby, Macnider	Minneapolis
Weum, T. W.	Minneapolis
Wheeler, D. W.	Duluth
Wheeler, M. W.	St. Paul
Whitacre, J. C.	St. Paul
Whitcomb, E. H.	St. Paul
White, J. S.	St. Paul
White, S. M.	Minneapolis
White, Willard D.	Minneapolis
Whitmore, Frank	St. Paul
Whitson, S. A.	Alden
Widen, W. F.	Minneapolis
Wieckman, F. H.	Sleepy Eye
Wiese, H. F. B.	Minneapolis
Wilbur, D. L.	Rochester
Wilcox, A. E.	Minneapolis
Wilder, R. L.	Minneapolis
Wilder, R. M.	Rochester
Wilken, P. A.	Minneapolis
Wilkerson, V. A.	Minneapolis
Wilkinsen, E. A.	Rochester
Wilkinson, Stella	Duluth
Will, W. W.	Bertha
Willcutt, Clarence	Minneapolis
Williams, A. B.	St. Paul
Williams, Clayton	St. Paul
Williams, H. L.*	Minneapolis
Williams, H. L., Jr.	Rochester
Williams, H. O.	Lake Crystal
Williams, L. A.	Slayton
Williams, M. R.	Cannon Falls
Williams, Robert	Minneapolis
Williams, R. V.	Rushford
Williamson, G. A.	St. Paul
Willius, F. A.	Rochester
Wilmot, H. E.	Litchfield
Wilson, C. E.	Blue Earth
Wilson, L. B.	Rochester
Wilson, R. H.	Winona
Wilson, Warren	Northfield
Wilson, W. E.	Northfield
Wilson, W. F.	Lake City
Wiltrout, I. G.	Oslo
Winnick, J. B.	St. Paul
Winter, J. A.	Duluth
Winther, Nora M. C.	Minneapolis
Witham, C. A.	Minneapolis
Withrow, M. E.	International Falls
Wittick, F. W.	Minneapolis
Wahlrabe, A. A.	Minneapolis
Wohlrabe, Clarence	Springfield
Wohlrabe, E. J.	Springfield
Wold, K. C.	St. Paul
Wolff, H. J.	Rochester
Wolner, O. H.	St. Peter
Woltman, H. W.	Rochester
Wood, D. F.	Minneapolis
Wood, H. G.	Rochester
Woodruff, C. W.	Chatfield
Woodworth, Elizabeth	Minneapolis
Woodworth, L. F.	Le Center
Workman, H. M.	Tracy
Workman, W. G.	Tracy
Wright, C. B.	Minneapolis
Wright, C. D.	Minneapolis
Wright, C. O.	Luverne
Wright, F. R.	Minneapolis
Wunder, H. E.	Shakopee
Wynne, H. M. N.	Minneapolis

Yaeger, W. W.	Ivanhoe
Ylvisaker, R. S.	Fergus Falls
Yoerg, O. W.	Minneapolis
Young, T. O.	Duluth
Young, V. A.	Duluth
Younger, L. I.	Winona

Zachman, A. H.	Melrose
Zanger, Isabelle M.	Minneapolis
Zaworski, E. A.	Minneapolis
Zeien, Thomas	North Branch
Zierold, A. A.	Minneapolis
Zimmermann, H. B.	St. Paul
Zinn, C. J.	Rochester

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*Deceased.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, MARCH 1, 1932

BY EXAMINATION

(January)

Name	School and Date of Graduation	Address
Albers, Edward Charles	U. of Pa., M.D., 1930	Mayo Clinic, Rochester, Minn.
Austin, Villairs Thomas	U. of Ore., M.D., 1929	Mayo Clinic, Rochester, Minn.
Andre, Hugo Carl	U. of Minn., M.B., 1931	3019 37th Ave. S., Minneapolis, Minn.
Baker, Abe Bert	U. of Minn., M.B., 1930; M.D., 1931	621 Oliver Ave. N., Minneapolis, Minn.
Beckman, Wallace Gerald	U. of Minn., M.B., 1931	Swedish Hospital, Minneapolis, Minn.
Biederman, Albert Alfred	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Blumstein, Alex	U. of Minn., M.B., 1930; M.D., 1931	335 St. Anthony Ave., St. Paul, Minn.
Cook, Norman Corrigan	U. of Man., Canada, M.D., 1930	Mayo Clinic, Rochester, Minn.
Danielson, Julia Hanson	Rush Med. Col., M.D., 1931	Litchfield, Minn.
Danielson, Lennox	Rush Med.Col., M.D., 1931	Litchfield, Minn.
Doroshow, George David	U. of Minn., M.B., 1931	1352 Goodrich Ave., St. Paul, Minn.
Faue, Clarence George	U. of Minn., M.B., 1931	1515 Charles St., St. Paul, Minn.
Freeman, Leonard, Jr.	U. of Colo., M.D., 1929	412 4th St. S. W., Rochester, Minn.
Garvin, Robert Odell	U. of Pittsburgh, M.D., 1929	Mayo Clinic, Rochester, Minn.
Ghiselin, Alex. Dickinson, Jr.	Columbia Univ., M.D., 1929	Mayo Clinic, Rochester, Minn.
Goodwin, Thomas Wright	U. of Georgia, M.D., 1930	Mayo Clinic, Rochester, Minn.
Hottinger, Raymond Creighton	Creighton Univ., M.D., 1930	Janesville, Minn.
Kettlewell, Ralph Burnsell	U. of Minn., M.B., 1931	2525 Garfield Ave. S., Minneapolis, Minn.
Keyes, Howard Craig	U. of Buffalo, M.D., 1928	Mayo Clinic, Rochester, Minn.
Kirch, Walter	Royal Univ. of Florence, Italy Diploma of Doctorate, 1925	Mayo Clinic, Rochester, Minn.
Kugler, Alex. A.	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Lansbury, John	Queen's Univ., Canada, M.D., 1926	Mayo Clinic, Rochester, Minn.
Martin, Melvin Sylvester	U. of Minn., M.B., 1930; M.D., 1931	Sedan, Minn.
McDonald, Angus Morris, Jr.	U. of Pa., M.D., 1928	Mayo Clinic, Rochester, Minn.
Mork, Byron O., Jr.	U. of Minn., M.B., 1930; M.D., 1931	Worthington, Minn.
Ouellette, Alfred Joseph	Loyola Univ., M.D., 1931	707 Fullerton Pkwy., Chicago, Ill.
Parkhill, Edith Muriel	U. of Wis., M.D., 1930	624 4th St. S. W., Rochester, Minn.
Parker, Wilbert Howard	U. of Wis., M.D., 1930	Eyota, Minn.
Purves, George Harland	U. of Minn., M.B., 1931	St. Mary's Hospital, Duluth, Minn.
Raaf, John Elbert	Stanford Univ., M.D., 1930	Mayo Clinic, Rochester, Minn.
Robertson, Murl John	U. of Minn., M.B., 1930; M.D., 1931	Bayfield, Wis.
Rogers, Sydney Francis	U. of Minn., M.B., 1931	906 E. 6th St., St. Paul, Minn.
Rosenthal, Nāna Lu	Col. of Med. Evang., M.D., 1931	800 W. Winona St., Austin, Minn.
Rosenthal, Frank Harold	Col. of Med. Evang., M.D., 1931	800 W. Winona St., Austin, Minn.
Rudolph, Edward August	U. of Mich., M.D., 1931	Mayo Clinic, Rochester, Minn.
Schamber, Dean	U. of Minn., M.B., 1931	513 Summit Ave., St. Paul, Minn.
Sisk, Harvey Ernest	U. of Minn., M.B., 1931	Mazeppa, Minn.
Stafford, Charles Eugene	U. of Minn., M.B., 1930; M.D., 1931	Kensington, Minn.
Thorp, Edward George	Harvard U., M.D., 1929	603 1st St. S. W., Rochester, Minn.
Van Hale, Laurence Aloys	U. of Minn., M.B., 1931	951 14th Ave. S. E., Minneapolis, Minn.
Van Slyke, Cassius James	U. of Minn., M.B., 1927; M.D., 1928	3925 Pillsbury Ave., Minneapolis, Minn.
Watz, Clarence Emanuel	U. of Minn., M.B., 1931	Ancker Hospital, St. Paul, Minn.
Wood, George Thomas, Jr.	Jefferson Med. Col., M.D., 1928	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Name	School and Date of Graduation	Address
Clark, Anson Luman	Rush Med. Col., M.D., 1929	Mayo Clinic, Rochester, Minn.
Lovett, Beatrice Russell	Rush Med. Col., M.D., 1924	Oak Terrace, Minn.
Powers, Kenneth Vernon	Northwestern U., M.D., 1930	Rood Hospital, Hibbing, Minn.
Rydell, Otto Ellwood	U. of Wis., M.D., 1928	2129 John Ave., Superior, Wis.

NATIONAL BOARD CREDENTIALS

Name	School and Date of Graduation	Address
Gronewald, Tula Wilhelmina	Woman's Med. Col. of Pa., M.D., 1929	Fergus Falls, Minn.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XV JUNE, 1932 No. 6

PUBLIC HEALTH ORGANIZATION AND THE MEDICAL PROFESSION*

A. J. McLaughlin, M.D.
Medical Director, United States Public Health Service, Interstate Sanitary District No. 3
Chicago

THE development of present day practice of public health and preventive medicine is a glorious achievement. The major credit for this must go to physicians both for the research results and for the application of the knowledge of disease prevention thus secured. There are, of course, notable exceptions. Pasteur was a chemist and many research workers who discovered facts in preventive medicine were not physicians, but almost without exception the men who have brought order out of chaos and who have developed health departments to their present state of efficiency have been physicians. Not only were doctors responsible for the major part of the discoveries, but it was the doctor acting as health officer who applied this new knowledge, and developed the system of wholesale preventive medicine which is the chief objective of health departments today.

All this development of preventive medicine was the work of doctors as individuals interested in the possibilities of preventive medicine. Collective action by medical societies for developing preventive medicine was conspicuously absent until the past decade. The overwhelming majority of practicing physicians up to recent times did not practice preventive medicine. This was not their fault. They had been taught to care for the sick and injured and preventive medicine was not taught in our medical schools to undergraduates in an effective manner until the present decade.

Since 1900 preventive medicine has made rapid progress in health departments due to the vigorous efforts of health officers. The great unofficial health agencies by educational propaganda have insisted on prevention and the development of facilities for prevention rather than cure.

During these past three decades the practicing physicians have held to what they considered their primary duty of treating the sick and injured. They have been reluctant to establish clinics for examination of apparently healthy people or to immunize or vaccinate against disease except upon individual request. It was natural, therefore, that both official and unofficial health agencies, in their enthusiasm, and in the absence of facilities for early diagnosis, should establish clinics and create in the public mind by education a demand for protection against contagious disease by immunization and for the discovery and early correction of disease and defects.

Unofficial agencies and the great foundations devoted large sums of money for preventive work, educational and otherwise, and official health departments secured large appropriations for the prevention of diphtheria, typhoid fever, tuberculosis and later venereal disease.

As a result, practicing physicians saw all kinds of clinics develop and expand which seemed to be taking their patients away from them. In the past forty years public health administration established both fixed and traveling clinics, conducted wholesale immunization campaigns and examinations for discovery of defects in school children. All of this is work that should be done by the practicing physician. The only excuse for the invasion of the physicians' field was that physicians, individually and collectively, would not practice preventive medicine. No health officer could sit idly by, while children died, incipient tuberculosis became advanced and venereal disease ran rampant—when aggressive action, though wrong in principle as an invasion of the physicians' field, could prevent this unnecessary loss of life.

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*Presented before the Minnesota State Sanitary Conference, St. Paul, December 14, 1931.

The gulf thus developed between the practitioners of preventive medicine and the practitioners of curative medicine should never have been created. It is now fortunately being bridged over and eliminated. Preventive medicine is now being taught to undergraduates in all Class A medical schools. Medical societies as collective units are preaching preventive medicine. The average practicing physician now recognizes preventive medicine as his job, and the more progressive ones concede it to be the more important part of their job.

Even with the amazing development of preventive medicine activities since 1900, the immunization campaigns, drives for early discovery of diseases and defects, pre-natal clinics, baby welfare stations, clinics for tuberculosis, venereal and other diseases, certain fundamental defects are apparent in our public health programs which can only be corrected by the concerted effort of county medical societies properly organized, or by further expansion of state medicine into the doctors' field.

1. *Maternity and Infancy.*—Health departments and unofficial activities have secured results in reducing very greatly the infant mortality rate, but this reduction is almost entirely in children over one month old. The death rate for mothers and for babies under thirty days old still remains unnecessarily high. The only way in which this high rate for mothers and children under one month can be reduced is by better prenatal and obstetric care by physicians, who have had proper, adequate training in obstetrics and who have available expert consultant advice and lying-in hospital and clinic facilities. The ignorant midwife is responsible for much, but part of the blame attaches to physicians practicing obstetrics without adequate training or experience and who do not have access to expert advice or a lying-in clinic and hospital. To correct this is the job of the organized county medical society aided by the state medical society and the medical department of the University.

2. *The Pre-School Child.*—Our greatest defect in public health work today is our failure to secure preventive work in the child from one to five years old. With all our clinics, splendid work by public health nurses, efforts of parent-teachers and other organizations, we have barely scratched the surface in this field. Preventive medicine in this age group can only reach its full possibilities through the initiative of the properly organized county medical society assuring the individual participation of all its members. The health department with this coöperation could thus secure the necessary preventive work in this age group, instead of waiting for school age.

3. *Preventive Medicine for the Adolescent and Adult.*—Here the great need is general practitioners who have knowledge of modern technic for early diagnosis in the incipient stage and who have such equipment available. It is too much to expect that they should have this equipment in their individual offices; but the equipment and apparatus should be readily available, within easy reach and freely used. Too often we find plain symptoms of gastric or duodenal ulcer treated for months by prescription as indigestion; incipient tuberculosis treated by prescription for months without diagnosis until it becomes moderately or far advanced; pathologic conditions of gallbladder or appendix without a Graham test or X-ray treated for months by prescription until some acute climax forces operation or causes sudden death; hyperthyroidism and hypothyroidism receiving perfunctory office treatment by prescription without basal metabolism tests; treatment of female genital complaints by tampons or by guesswork surgery; and office treatment of many other conditions without the use of modern diagnostic methods.

In the large cities and medical centers the diagnostic equipment is available and more likely to be used, and the general practitioner of fifty or more years of age is likely to have kept pace with the advances in diagnostic technic. In the small cities and towns and in the large rural areas, where the average age of physicians is fifty-two years, it is quite another story. If a man or woman not acutely ill asks for examination or treatment, the examination is perfunctory and incomplete. The campaign and propaganda for annual physical examinations of the apparently healthy fell far short of its possibilities, because in cities the examination costs too much or the applicant fears an unknown cost, while in the small cities and towns and rural areas the facilities for complete examination did not exist.

FACTORS IN THE FAILURE OF ORGANIZED MEDICINE TO CORRECT THESE DEFECTS

1. *Lack of Organization.*—We speak of the organized medical profession, but its organization is little more than provision for periodic meetings for the reading and discussion of papers on scientific subjects. An exaggerated sense of ethics makes many physicians shrink from anything like business organization; yet organization on a business basis, provision of clinic facilities, regulation of fees on a sliding-scale basis according to income are essential if State medicine is to be prevented. There are notable exceptions. The medical society of Kings County (Brooklyn), the New York Academy of Medicine, and the Wayne County (Detroit) medical society have taken steps toward business organization with a view toward social service, but, except for these and a few others in the large cities, county medical societies are unorganized except for periodic scientific meetings. The business side of their real obligation, to establish facilities for the best preventive medicine and surgical advice and treatment at a price that each citizen can afford, is entirely neglected.

2. *Cost of Medical Care.*—The best modern medical care is worth all you pay for it, provided you can afford the cost. The cost has not increased out of proportion to the costs of other services. Medical care, especially early diagnostic procedures and treatment, has been expanded and amplified by the discovery of more precise methods of diagnosis and has become exceedingly complex. This necessarily increases the cost of examination as compared with that of forty years ago, when the physician used only his own senses and perhaps a stethoscope.

In the large cities the facilities for early diagnosis and for the best preventive medical and surgical care are available. The trouble here is that the man of moderate means does not know what it will cost; and, fearing that the cost will be excessive, he avoids the doctor and the clinic and neglects himself and his family until serious illness or injury results. In the small cities, towns, and rural areas, lack of proper early preventive treatment is not due to the cost, but is due to lack of facilities for early diagnosis and treatment. I have seen in many small cities a small modern hospital approved by the American College of Surgeons but without an out-patient department. What does this mean? There is no provision for preventive medicine; a man must be knocked down by an automobile, have typhoid fever or pneumonia, in other words, be seriously injured or acutely ill before he comes in contact with the modern equipment of such a hospital. There must be a decentralization of modern equipment from the large cities and medical centers to the small cities and towns, and also a better distribution of young physicians who know how to use this equipment.

3. *Distribution of Doctors.*—Next to the need for out-patient facilities and modernly equipped clinics, the greatest need in the small city, town and rural areas is for more and better trained physicians.

The young medical graduate of a Class A school today is trained in preventive medicine and is taught to use the modern instruments of precision in diagnosis. He learns to depend upon the modern facilities which are used in his college and hospital training. These are available in the city, and, hence, he stays in the large city. He will not go to the small town because these facilities do not exist and he cannot practice medicine in the way he has been taught. Here again the remedy is obvious—there must be decentralization of modern diagnostic and treatment facilities from the large cities and medical centers to the small city.

In the distribution of young, highly trained graduates, the law of supply and demand is inoperative. Why? The reasons given above explain. The young physician would go to the small city or town where the demand for his services is greater, and the remuneration also greater, rather than practice in the keen competition of the city over-crowded with physicians, provided he could practice medicine in the modern way with modern facilities, which he considers indispensable.

REMEDIES SUGGESTED FOR CORRECTION OF THESE DEFECTS

1. *Provision by County Medical Societies for Equipment for Early Diagnosis and Treatment.*—The citizens living in small cities, in towns, or rural areas are, in common justice, entitled to the use of up-to-date facilities for diagnosis and treatment quite as much as the wealthy or the poor living in the large city or medical center.

The county medical society should establish or cause to be established in the county seat and, in populous counties, in other small cities outpatient clinics completely equipped for early diagnosis and treatment. They should fix the fees on a sliding scale according to income—for example, dividing the clientele into three or more classes, as follows:

a. The indigent to be paid for by the county at a fixed rate.

b. Those earning less than $1,500 per annum to pay a minimum fee.

c. Those earning from $1,600 to $2,400 per annum to pay a higher fee.

d. Those earning over $2,400 per annum to pay full fees.

The fees for house or office visits should be determined for those same classes. The facilities for diagnosis or treatment in the out-patient clinic or hospital should be available to all members of the medical society and the fees collected divided pro rata.

2. *State Medicine.*—The term "state medicine" is used here because it commonly signifies the bogey that continually confronts the practicing physician. State medicine means the assumption by the Government (Federal, State, or municipal) of the obligation to give every citizen or group of citizens medical and surgical care. In general, this would mean the State government; but the same results, as far as the practicing physician is concerned, are possible by the encroachments of private corporations which assume this obligation for their employees, using salaried physicians to do the work.

The advocates of State medicine have claimed that the defects noted above in our public-health activity would be corrected by State medicine, because medical and surgical and, presumably, preventive advice and treatment would be available to all citizens without cost. One must admit that, theoretically, under such a system, treatment would be available to all; but some doubt that there would be entire satisfaction with the quality of such medical care. The average American citizen feels that he is entitled to adequate treatment, and he has been educated to the point where he knows something of the newer methods and equipment used in modern diagnosis and treatment.

In presenting this paper there were two objects in mind: the first concerning the practicing physician; the second concerning pubic health administration. I should like to see the medical profession solve its own problem in its own way without outside interference by governmental or any other agency. Proper organization of county medical societies will make State medicine impossible, enable the physician to retain his self-respect, and preserve that priceless, intimate, confidential relation that should exist between physician and patient. In regard to the second objective, more efficient public health administration, this same organization of county medical societies would also correct the defects in our public health activity cited above. It will make possible better lying-in facilities and better consultant advice for prenatal work. It will provide the machinery now lacking for early diagnosis and treatment of diseases or defects in the pre-school child and in adolescents and adults as well.

THE INEVITABLE END OF PUBLIC HEALTH WORK

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In reviewing the history of public health work one notices a constant widening of the conception as to what constitutes its legitimate scope and a continued broadening of its field of activity. At first simply an agency for the prevention of the spread of contagious disease, its attention was confined to quarantine regulations and a so-called terminal disinfection, the efficiency of which seemed to have been gauged more by its offense to the olfactory organs than by any real knowledge as to its lethal effects on the bacteria concerned. Elementary common sense, however, soon suggested that the best way to control such diseases was to prevent their originating, and knowledge was sought of the causes and means of destroying these before they could produce disease. Thus the connection between typhoid fever and the water supply was discovered, and public health work had to extend itself into the field of sanitary engineering.

Similarly blind quarantine and fumigation had little effect on the incidence of yellow fever, but when its connection with the mosquito was learned it became possible to wipe the disease out, though to do it the health department had to take upon itself the task of draining swamps.

Contagious disease, however, constitutes but a relatively small part of the ill health of a community, not more than 5.6 per cent, according to De Porte[1] after making a survey in New York state. Progressive health officers have, therefore, not hesitated to extend their operations in any direction in which they think they see an opportunity to lessen morbidity. Thus, when the connection between endemic goiter and lack of iodine was demonstrated, they exerted themselves towards seeing that growing children were supplied with a sufficiency of that element, and have also promoted soil surveys to determine its iodine content. The possibilities from an extension of this work are great, for we really know very little of the mineral metabolism of the body, and insufficiency of inorganic constituents of foodstuffs may have much to do with disease.

It has been difficult, however, to bring the public to an appreciation of positive health measures. It is always easy to get them to visualize the dangers of a person sick with a disease like smallpox, and measures directed towards a curtailment of such an individual's activities are fairly sure of receiving general approval, though possibly not of the individual himself, but methods of disease prevention which require some definite action on the part of those apparently well are not so well received, as witness vaccination against smallpox. Difficult also has it been to bring people to a realization of the fact that apparent health may not be real health, that disease may be latent or masked, only to be appreciated by the expert, or that, while a person may not be actually diseased, his bodily processes may be working poorly on account of faulty habits or a bad environment, or that the development of children may be impaired because of the ignorance or poverty of the parents or guardians.

Neither has it been easy to obtain public acceptance of the idea that these were matters which concerned any others than those immediately affected. Each individual was supposed to be able to work out his own salvation, and how he and his family lived was nobody's business but his own. Even the churches, which had theoretically long answered in the affirmative Cain's question, "Am I my brother's keeper?" seemed to fail to see the logical implications of their answer, and though often waxing eloquent over the pitiable plight of the poor benighted heathen, whose uniform, as Kipling expressed it, "wasn't much before, and rather less than half of that behind," frequently failed to visualize the still more pitiable condition of the child at their doors, who had to meet the rigors of a northern winter with insufficient calories inside him, and too little clothing outside him to keep even these few calories in.

Some there were, however, who took their religion seriously, and, aided by pure humanitarians, and not a little, be it said, by so-called radical politicians, succeeded in educating public opinion on these matters until legislative and other measures were initiated to mitigate in some degree the evils. Further, business and commercial leaders began to appreciate that sickness and malnutrition in their workers represented an economic loss to them, while the World War focussed attention on the large number of men whose efficiency as war material was impaired or altogether destroyed by physical deficiencies which could have been prevented. Thus a combination of altruistic and purely utilitarian motives succeeded in bringing about a very much greater interest in public health work until now we have almost an embarrassment of riches in agencies to promote it, often, I am afraid, to the discomfiture of the health official, who has to serve as a buffer between the proponents of the various plans and the legislature from which he has to extract the necessary financial assistance.

Unfortunately, these activities largely lack intelligent direction and coördination. Depending, as many of them do, on private initiative, they are necessarily often erratic and sporadic. One community may be the possessor of an energetic and public spirited citizen who by sheer force of personality focusses attention on these matters and gets things done, while an adjoining community, lacking such a guiding spirit, is altogether neglectful of them. Boards of health, especially local ones, are in similar plight. The progressive community has an efficient full-time health service, while the unprogressive one satisfies itself with the casual ministrations of some more or less competent doctor, who expects to make up for the deficiencies in remuneration by the advertising which he thereby obtains. The very fact, however, that such a gesture of public health service is made at all is eloquent testimony to the success of the campaign of education which has been carried on. In one phase of it, the care of infants and children, so far have we gone from the old doctrine of the parent's exclusive rights and responsibilities, that President Hoover, whom no one could accuse of socialistic tendencies, can say:[2]

"The ideal to which we should strive is that there shall be no child in America that has not been born under proper conditions, that does not live in hygienic surroundings, that ever suffers from under-nourishment, that does not have prompt and efficient medical attention and inspection, that does not receive primary instruction in the elements of hygiene and good health, that has not the complete birthright of a sound mind and a sound body, that has not the encouragement to express in fullest measure the spirit within which is the final endowment of every human being."

All of which is very good, and may be presumed, I suppose, to express the attitude of the major political party in this country, in other words, the consensus of American opinion, but we have a long way to go before achieving these ideals, and our politicians will have to enlarge many of their conceptions as to the functions of government before we do so.

If the child is to live in hygienic surroundings attention will have to be given to the problem of housing. I do not believe that any country in the world can show a larger proportion of fine homes, well equipped with facilities for good living, than America. But can anyone familiar with the living conditions of the poor in both town and country—and remember that here, as elsewhere, the poor, the relatively poor, if you will, make up the mass of the population—maintain that these are satisfactorily housed? Slums in the city and shacks in the country abound, and, though to have been born in a log cabin may be an asset if one aspires to be president, continued living under such conditions does not make for health. Hilda Rose's Stump Farm is a revealing illustration of life on a homestead, and no one with personal knowledge of these conditions can say it is overdrawn.

To be born under proper conditions means that every pregnant woman has medical care and supervision; that, if unable to provide it for herself, she is furnished proper food, and that her confinement takes place either in a hospital or some house where the necessary facilities can be obtained. Those of us who have done obstetrical work, either in the town or country, know how widely the actual conditions fail of the ideal. I have myself delivered women in places which I would not have chosen for the parturition of a valuable dog. Many women receive no attention at all until their hour arrives, and then hasten to secure the services of any doctor they can manage to get hold of. That they get one at all is often a matter of luck, for, knowing how poor are the chances of getting paid in such cases, doctors are becoming increasingly shy of attending them, and I think there is a growing feeling of resentment in the profession at having the burdens which should be assumed by society in general thrust upon their unrequited shoulders. Antenatal clinics have been organized in some places to meet some of these needs, and do good work, but, as emphasized at the Congress of Obstetricians and Gynecologists at Dublin,[3] the only suitable individual to take care of a woman during her pregnancy is the one who is to attend her during her parturition.

How much "prompt and efficient medical attention and inspection" does the average infant get? Unless some gross nutritional condition or an infectious disease arises it is never seen by a doctor at all. The milder degrees of malnutrition, the chronic diseases, are all generally overlooked, perhaps to be discovered when it is too late to do anything for them. Some of our women's organizations are making praiseworthy efforts to provide for their needs by holding occasional clinics, to which mothers are invited to bring their children for inspection, but though undoubtedly much good is done in this way, it is at the best a makeshift arrangement. It does not provide the constant attention which alone can secure proper results; neither is there any assurance that the medical attention is of the efficient kind desired by the President, for generally it is expected to be given gratuitously, or nearly so, and such service is notoriously not always competent.

Perhaps the school child receives the most attention at present. But even here there is great diversity in method. Some schools have school physicians, more have school nurses, but many have no care at all. The provision of school nurses is altogether admirable, but adequate health service needs medical men and women. Notwithstanding the overloaded curriculum in training schools for nurses, and notwithstanding the ambitious examination questions to which nurses are subjected by state boards, many of which, by the way, I am perfectly sure I would fail on myself, nurses are not doctors. To make health examinations needs expert diagnosticians, even more so than to pick out the palpably sick. This can only be done by competent physicians, and these will often need specialist assistance, not forgetting the psychiatrist, for mental health is of no less importance than bodily health. Then, again, it is of no use to pick out the sick unless the necessary treatment can be provided for, and for this we need the family practitioner.

However, childhood is only a period of preparation. The child is an economic liability, and unless, when his period of training is over, he becomes and remains a useful producing member of the social organization which has borne the expense of training him, its money has been wasted. Like any other machine, in spite of the most meticulous care in its manufacture, as soon as it is put into active operation it becomes subject to the effects of wear and tear and accidents which impair its usefulness and necessitate constant care and attention. Therefore, as an economic and engineering proposition alone (and President Hoover is too good an engineer not to see it if it were brought to his attention), the acceptance of the principles laid down by him necessarily and unavoidably leads to the acceptance of the further principle that to the adult also must be secured good hygienic surroundings, proper food, and efficient medical supervision and care. There is no altruism involved in this. It is simply good business to see that money expended brings an adequate return.

Big business is already beginning to grasp this, more and more recognizing that the health of the workers is of as much importance as the condition of the machines they operate. Absence on account of sickness always produces more or less disorganization, the degree increasing with the importance of the individual involved. Accordingly many corporations now arrange for the medical examination and care of their employes as a detail of their business, and each individual, being part of the machine, is selected so that he will give as little trouble as possible. But their whole idea is to reduce costs, even their medical services being arranged on this basis. Dr. Watson, of the American Telegraph and Telephone Company, throws an illuminating sidelight on what can be expected from them in public health work when he says:[4] "Throughout industry in general the funds available for the employment of physicians will not permit medical departments to hire experts. Further, as medical work grows in any given industry, the various steps of examination will have allotted to them a time limit, indicating to the medical employe that he must likewise produce and get his product out with a certain amount of celerity." I suppose the next step in this process of speeding-up will be to put the patient on a conveyor, and have the various physicians do their part of the examination as he comes by.

But even if this service were of the best it still leaves out a large part of the community. There are those employed by the smaller aggregations unable to afford a medical department, those temporarily out of employment, the aged, and those who through sickness or other reasons have been "scrapped" by industrial concerns. These must depend upon what arrangements they can make personally for medical service, and, as they are the least able to pay for these services, they will either have to depend on charity or the benevolence of the private practitioner. This is a serious matter for him, for, as was emphasized to me recently by a general practitioner in Philadelphia, more and more are those best able to pay for service being taken from him.

For the efficient promotion of the nation's health we need some coördinated system which will make provision for the medical care of all the people at all times of their lives. This, I take it, is the logical end of all the public health teaching of the last few years. Both officially, as public health officers, and privately, as practitioners of medicine, the medical profession has been engaged in educating the public as to what could be done in the matter of improving or preserving their health. We have taught them how many diseases can be prevented. We have shown them the importance of proper food. We have stressed the value of periodic examinations. And so seriously has the public taken our teaching that they are now crying out for all these things. Unfortunately, however, it does not seem that at any time we have given serious consideration to the problem as to how these things are to be supplied. The economic side has been almost entirely neglected. At the same time that we have been emphasizing the need for medical services the cost of them has been rising, largely because of the improved methods we have adopted. X-ray examinations, blood chemistry, basal metabolism, electrocardiography, to mention only a few, are no longer luxuries but necessities, and the public have learned the value of them. As a result, they are exhibiting a most disturbing interest in the whole matter of medical practice as at present conducted. The magazines are full of articles on the subject, all showing a most pronounced dissatisfaction with the present conditions, and demanding that a serious effort be made to devise some more satisfactory method.

Typical of these is an article in the New Republic of June 5, 1929, "Public welfare workers have found that the cost of illness . . . has become so great as to involve the financial ruin of many families so afflicted, or, indeed, so prohibitive as to render proper medical care impossible. They have also found that the average professional earnings of physicians and surgeons are too low to offer a proper return for the elaborate education and training necessary to attain and maintain that high professional efficiency which is demanded at the present time." It goes on to say that "even in the cities a large proportion of the population goes without adequate medical attention. In the Mulberry district of New York it was found that 16 per cent of the persons confined to their homes on account of illness and 22 per cent of those too ill to be at work obtained no medical care from a physician." It concludes: "The subject is of such importance that a comprehensive canvass of the situation is imperative, and is a work of such magnitude that it must of necessity be governmental in character."

The recent action of the Chicago Medical Society has further focussed attention on the matter, and unfortunately left the impression that the medical profession is averse to any change. Personally I cannot help feeling that this impression has some slight basis. It is reflected in the attitude[5] assumed by the Journal of the American Medical Association towards the Sheppard-Towner bill, an attitude based, as far as I can gather, on its injection of federal activities into state affairs. One would be inclined to think that the writer was a dyed-in-the-wool Democrat from his enthusiasm for state rights. I do not notice the same righteous indignation against federal aid for good roads. It is too well known that without federal aid our automobiles would still be stuck in the mud most of the time. Personally, though I strongly believe in the academic doctrine of states' rights in general, I am sufficiently pragmatic to take advantage of federal assistance whenever it will do any good. I strongly suspect the editorial writer to be guilty of what the psychologists call rationalizing, the real reason for his attitude being the bogey of interference with private practice, a suspicion strengthened by the statement[6] that neither the Sheppard-Towner act nor the later bill "lays down any line of demarcation between the welfare and hygiene of mothers and children and the welfare and hygiene of the rest of the people," a neglect, to my mind, caused by the very simple fact that there *is* no line of demarcation, for whatever affects the welfare and hygiene of the mass of the people necessarily and consequently affects the welfare and hygiene of mothers and children. How indeed can the health of the mother and children fail to be affected by the sickness and consequent loss of earning ability of the husband and father?

In fact the attempt to draw a hard and fast line between what is known as public health work and general medical practice is an impossible one. They overlap in all directions, and because of this overlapping the efficient health officer is continually getting into trouble with the rest of his professional brethren for poaching on their preserves. It cannot be too strongly insisted on that no one has any vested rights in the sick. These are a national liability, and the nation, through its agencies, has the right—nay, it has a duty—to make whatever arrangements it deems best for their care. As public spirited citizens we should further these efforts, though as men of business whose services in the matter are required, we have a right to insist that fair and equitable terms be made for these services. We should see to it that we are not exploited, as we so often are under present conditions.

Fair and equitable terms, however, does not mean a system by which some men may amass fortunes. I can easily understand the satisfaction with the present system on the part of some of our medical hierarchy, especially those directing large and wealthy clinics. It must be very gratifying, and tickle one's self-esteem hugely, to be able to point to the large amount of charitable work done for the poor, the while one recoups oneself by charging outrageous fees to the well-to-do. Such medical largesse reminds me of the noble highwayman whose exploits used to thrill me as a boy, who held up the stage coaches and robbed the wealthy, and then from his unhallowed makings gave doles to the poor. In proportion to his income the average country doctor does more charitable work than the whole lot of them put together, and as a consequence he is dying out. This cannot be permitted, for we need him. No public health service can be effective which fails to include the man who visits the sick in their homes, and a coördinated system of medical service will provide for just remuneration to him and all engaged in practice. We can do without the medical plutocrats.

This coördinated system of medical practice, which will knit together boards of health and medical practitioners, having as its principal object the prevention of disease, but providing medical service for all the people who need it whenever they need it, and effectively carrying out President Hoover's expressed ideals, I believe can only be achieved by some system of insurance against sickness, such as is in practice in some of the European countries. What the details should be I do not pretend to know. Probably we should have to modify them to suit conditions here, though I do not believe we should find the fundamental conditions very different. Undoubtedly this country is rich, richer probably than any country ever has been, but here, as elsewhere and at all times, the riches are unevenly distributed. I read the other day that 90 per cent of the wealth of America is owned by 10 per cent of the population. Most people only just manage to make a living and meet their ordinary expenses, and when serious sickness comes large numbers are dependent upon public or private charity, often, indeed, the unaided charity of the doctor. There is no reason for believing that this will ever be different, for men and women are fundamentally unequally endowed with capacities, political buncombe to the contrary notwithstanding. The parable of the talents is as true today as when it was uttered. Some have ten, some five, some one, and some will even fail to use what little they have. One remembers in this connection the results of the army intelligence tests. Hewers of wood and drawers of water must many of these be all the days of their lives. If you believe that these inefficient ones should be ruthlessly left to the play of natural forces that they may be wiped out, then, of course, I have no argument, but in that case public health work has no meaning.

Any such system will have to be compulsory, at least for the masses, for otherwise those who need it most will not have it. Life insurance demonstrates this, for in spite of an army of solicitors many have none at all. By such a system the burden of sickness would be spread over the whole nation, like national defense, and when one considers the enormous amount at present spent under our uncoördinated system, I doubt if the total cost will be greater than it is now, even when all are properly provided for. Incidentally it is of interest to note that it has been estimated[7] that an average of $6.30 per capita per annum is spent in this country for drugs alone, as against 59 cents for public health work in 1923. You will have to have far more faith in drugs than I if you believe this money to be well spent. Whether this system of medical service should be run by government agencies as part of the public health service, or through the medium of private companies, is a matter to be carefully considered, but the more the element of private profit could be kept out the better. One calls to mind in this connection the methods of the Life Extension Institute. It would be reasonable to expect a contribution from the federal government, for every man (and under present conditions every woman) is expected to be at its call in time of war, and it is to its interest to see that its potential war material is kept in a condition to be fit for service when needed. For the same reason industry could be expected to contribute. I make no pretense to enumerate the details. The purpose of this paper is simply to plead for a consideration of the subject, to point out that the logical end of public health work demands such a system, and that, as in the past it has had continually to enlarge its conception of its legitimate field to achieve its purposes, so now it should take up the study of sociology for the same end.

If preventive medicine is to be developed, the gap between public health work and the general practice of medicine will have to be bridged, and though this to some of us may mean the giving up of some of our so-called independence, it will be but in accordance with the general spirit of the times, which has been so well expressed by Professor Shotwell in his book, War as an Instrument of National Policy: "A new attitude is revealing itself in business and internal economics, one which seeks to substitute for ruthless competition some measure of coöperation, so that each member of the community may have a larger share in increasing the common good."

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PERIODIC HEALTH EXAMINATION: A DISCUSSION*

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THE first function of physicians is treating the sick. The process of a health examination is a definite departure from our usual vocation. It perhaps requires greater insight into human nature than is required in helping the ill back to health. There should be a nice balance of judgment between over-zealousness to correct what might be termed a normal abnormality and care to give attention to an apparently insignificant finding for which medical advice ought to be given. The doctor who probably best renders this service is the personal physician who knows something of the client's habits, his family, and his finances, and it can best be rendered in his own office.

The program of periodic health examination consists of an effort on the part of physicians to utilize preventive medicine which shall be all-inclusive to the laity. Its scope and possibilities are probably as great as any public health activity at present adopted. Child welfare and similar movements have made the public mind receptive. The present agitation for periodic examinations might be termed a "revival," for sporadic attempts have flared up and cooled off during the past eight or ten years.

Probably the most concerted effort is that of the health examination campaign of The Greater New York Committee on Health Examination. Its success promises profoundly to affect for the better the relations of the patient and the physician. The Greater New York Committee last April inaugurated a carefully formulated five-year program. They issue gratis to physicians a monthly pamphlet called the "Health Examiner." The movement is spreading over the country, and the aggressive medical profession of Minnesota will not be lagging.

The idea of examining well persons perhaps has a religious origin in an attempt to cleanse the soul. It was first recorded by Dr. Dobell in England in 1861 and again sponsored by Dr. George M. Gould of Philadelphia in 1900. In 1923 a committee of the American Medical Association, headed by Dr. Haven Emmerson, issued a pamphlet as a guide for examiners. This is well composed. The Canadian Medical Association issued a similar guide about 1928.

Preventive medicine recognizes the fact that early detection and correction of anatomic defects, faulty function, and unhygienic habits of life make for longevity and life-long physical and mental efficiency.

The scope of the examination is as broad as the ability of the examiner, its length may be gauged by the time available and the difficulties encountered, whereas its depth is measured in the benefits received by the one examined. The client has the assurance of well-being, and confidence that he has had a thorough analysis and any fault brought to his attention. The success of the movement depends on the physician. Social reforms are likely to be distrusted by the average mind; however, probably all men and women will welcome the word of their physician that after a careful examination he can find no unnaturally destructive process. The degree of expertness of the physician in the art of medicine will be reflected in whether his results have been worth while to his health clients. Tact will be required not to make a neurotic of a patient with an inconsequential heart murmur, and not to agitate an already introspective mind. Many adults accept abnormalities of body or function as predetermined and beyond their control and submit to them without thought of prevention, and often rightly so. Advice rendered should be such as will recall to the client the fundamental principles of hygiene that he learned in his youth and to make him healthfully conscious of his food, his activities, and his personal care.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the annual Conference of Secretaries of the Component Societies of the Minnesota State Medical Association, St. Paul, January 23, 1932.

Such advice as you choose to give must be for the future well-being of the applicant. Variations from the usual, in the form of moderate hypertension, overweight, underweight, or overly active or overly passive physique or mentality may be entirely normal for the person examined. We have no definite proof to the contrary. Nor do we know that some of the bad habits of the world shorten life, nor that other good habits prolong it. Dr. Raymond Pearl, director of the Institute of Biological Research of Johns Hopkins University, through a clipping bureau, investigated all reports in the press of persons celebrated for having attained a ripe old age. He concluded from the large number of answers to questionnaires that a family history of longevity was the most common and potent factor. In fact, there is abundant proof that much harm has resulted from over-zealous faddists who are more positive in their prognostications than you and I know they have any right to be.

It is easy to look at a patient, and after a short discussion say, "Oh, you're all right," or "Perhaps I might listen to your heart and examine your urine; you should watch your weight a little," but such a procedure is not the purpose of this program. The examination should be inclusive, systematic, and comprehensive.

For complete physical examination, the applicant should be undressed, and he should be examined conscientiously. Here, I believe, the procedure should end unless you have found something really wrong. Help the client to feel that a negative result is the most satisfactory issue. No one ever died of flat feet.

Furthermore, such examinations should be more or less standardized so that Mr. Doe undergoes practically the same routine as Mr. Dee, who may be examined in another city. The examinations must be reasonable in length and cost.

All this calls for a form, and I wish to submit that form adopted by the Pennsylvania State Medical Association as fulfilling the requirements better than any I have so far seen.

There are four pages. The fourth is blank for additional notes and records.

No one can be absolutely certain of the significance of indefinite and minor symptoms. Nature compensates for more or less severe loss of tissue or function, and with or without extensive laboratory and specialized examinations one cannot always be sure of a client's condition. When elaborations of means of diagnosis are indicated, the health client becomes a patient.

Examples of the degree of compensation by nature are found in the heart, circulatory system, kidneys, lungs, and digestive tract; even in cases of cancer of the stomach, muscular weakness, instability of the nervous system, and so forth, such compensation is found. A person does not consider himself ill until he suffers from "dis-ease."

Physicians who almost exclusively have been in attendance on persons with disease, treating serious or long-established processes that have interfered with the patient's comfort or earning capacity, may not find themselves at once prepared to guide applicants for health services in the practice of personal hygiene. Yet the examiner accepts this responsibility. He must give opinions which will make his services worth while.

The previously outlined, completed examination is but a guide on which to indicate abnormalities, but this record does not tell as much of the client as does your personal impression. This is where the art of medicine is manifested.

Your final conference is the lasting contact, and the final five minutes fixes the ultimate value.

Your advice and prescription may be a few words of assurance, or it may be a dissertation on the proper functions of any part of the body, or advice as to overweight or underweight, digestive disorders, insomnia, nervousness, or sexual relations. If you have fulfilled your duties, the health applicant usually will be satisfied.

The importance of properly conducted health examinations has been felt to be so urgent that it is being incorporated in the curriculum of some of the leading medical colleges. Health magazines, radio talks, and newspaper articles are advocating its adoption. Organized medicine is reviving the interests of the profession. Some will find its exactness laborious and tedious. There should be definite systems of record and follow-up. Later, as the accumulating records pile up, tabulation of your findings and comparison of these with those of other communities will add interest. Valuable information of vocational age groups would undoubtedly be revealed. The only other similar record is that of army officers; it is found that in this selected class of healthy young men, degenerative changes become apparent after about five years. Records should be made adaptable to the punch card system for future tabulation. Some practitioners undoubtedly will seek additional training and guidance. In this respect the university extension courses might prove helpful.

As a résumé, I would say that the examination should consist of a carefully conducted physical evaluation of each applicant, recorded on a standard form adaptable to tabulation from all sections of the state. It should end there.

One of the most difficult functions of a physician is to keep well persons from believing they are ill, and this consultation should be so conducted as to state the client's real condition.

Above all things, no physician should approach this program with an idea of feeding patients to his practice.

ECONOMIC THERAPEUTICS*

Albert H. Parks, M.A., M.D.
Minneapolis

I AM offering no apologies for presenting this subject rather than a scientific one, because, if I am able to judge from the morning conversation about the staff rooms at our hospitals, this subject is a live one.

As some of you know and as Amos and Andy express it, "we are in a state of repression." This is seriously affecting the members of our profession, as it is all others and involved with us are our hospitals and our graduate nurses.

If this were the only consideration, I would say that time alone would effect a cure. However, the cause of our present troubles goes back much further than our present economic state. I believe it behooves us as a profession, and our allies, the hospitals and nurses, to take some thought as to the reasons for our present situation and if there be any way to the solution of some of our problems, and an answer to our lowered standing with the general public, that we put our minds and our concentrated efforts to the solution of that problem.

Military experts contend that the best defense is a strong offense. This rule may apply to us. Let us not deceive ourselves. The medical profession and in part our allies, the hospitals and graduate nurses, are not popular with the general public. In other words they don't like the way we do business. Some time ago I read a list of the popular magazines and periodicals that have, in the last year alone, published articles criticising our profession, mainly from the economic standpoint and partly from the viewpoint of the layman, in regard to our so called Ethics. This list was staggering. Something is wrong when such a barrage of criticism is fired at any group of men as is being directed at our profession. It is not sufficient to say, "We know we are all right and all the rest of you are wrong." Perhaps we are and perhaps not. At any rate, in this instance, virtue is not its own reward. It appears to me that it is time that organized medicine had a rather thorough soul examination to see if there may be anything to the contention of our critics.

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*Read at the Asbury Hospital Staff, January 6, 1932, and re-read, by request, before the Hennepin County Medical Society, February 10, 1932.

Economic existence of our private hospitals is necessary to us as a profession, if we are to practise medicine. They are our workshops. It is necessary that we have competent trained nurses, as they are our allies. It is certainly necessary for the members of our profession, if we are to maintain the high standards set before us by our predecessors and to continue to advance in the science of practise of medicine as the times demand.

If we do not present a satisfactory answer to our critics and adjust ourselves to the demand of public service, the public, who is least competent to solve this problem, will answer it for us and probably unwisely.

I do not wish to pretend that I alone can suggest a corrective program but I do wish to present the following thoughts, which appear to me to be both critical and constructive, as the basis for argument and for your consideration and criticism, within our profession and not for public edification.

Publicity.—We have through our medical organizations and through years of undue emphasis on ethics, deliberately and with intent, kept out of the press, which is the general information source of the public, all except the most formal notices bearing upon the life work and activities of our profession and of our hospitals. Much of the material that has been presented and used by the press in a big way, has been public criticism of our profession by members or agents of our profession. As illustration, the widespread lectures and front page publicity a few years ago, that the majority of operations done in our hospitals were unnecessary ones and that anyone having lost a member of their family through operation or complications that must have developed in operative procedure, should promptly bear this fact in mind. This was front page news in every paper in the United States. Or more recently, the headlines from the Chicago newspapers, "Highjackers in medical work are assailed," by a prominent members of the medical profession, as incoming president of a medical organization. Another, "Spotlight of criticism on the profession as a cause of high cost of medical service." More recently, "Medical bootleggers." And these illustrations could be quoted indefinitely. I ask—is there any other profession that would try to correct their errors, if any, through such means? Do we not have sufficient private laundry facilities in our medical organizations and hospitals to take care of our dirty linen without waving it in the face of the general public?

I do not hesitate to declare that organized medicine has done more harm in this regard in lowering the esteem in which our profession was formerly held by the public than any and all other agencies openly employed against us. I do not approve, nor do you, of the objectionable individual advertising of the individual doctor, of his special skill, of his unusual operation, or such matter, but there is a middle ground that could be covered by news items, favorable and not critical of our profession. The press is as willing, I believe, to accept such publicity as unfavorable news. They want news.

Certainly one well known clinic has never, to my knowledge, despised favorable publicity and I admire their judgment and acumen in that regard. Favorable publicity of our local men and local hospitals helps us all. Unfavorable publicity hurts us all. It is about time we fought for each other instead of against each other. Every time I hear a special group in our profession undertake to promote themselves by unjustly roasting the rest of the profession in the public press, one local group criticise another group, or one member of our profession say derogatory things about another doctor, I think how useless, wasteful and pernicious it all is, and the sad thing about it is there is so little truth in any of it. I quote from the last bulletin of the American Medical Association: "There has been so much shooting at our profession by all sorts of marksmen, many of whom have used dum-dum bullets and other forms of ammunition forbidden under the rules of the game, that it is gratifying to one who still believes in the doctors of the land, to find an editorial here and there that gives some credit (to our profession) for sense, honesty and humanness." We will get sufficient opposition and unfavorable press comment by those opposed to our profession. We have been educated to the state where the only favorable publicity a doctor can read about himself, without blushing and dodging his colleagues, is his obituary.

Now, why is this so? It is not true of any other profession or even commercial organizations. A member of the sacred profession like the ministry may admit to a good friend, in private, that there is here and there an occasional brother who may stray from the "straight and narrow path," but I do not see the prominent members of their profession or their organizations bursting forth into print, and charging wholesale perfidy of their noble calling. No—they hold their trials in private and chastise their brethren in private, as the proven facts justify. Bankers do not vilify each other in public. Commercial organizations reprove and condemn unfair advertising on the part of any one of their members when such advertising hurts the entire industry, by supposedly boosting the individual advertiser. Does not even good taste dictate that family and professional quarrels, if any, be fought out in private? And then, strange to say, we are pained, grieved and hurt when the public take us at our own advertised valuation.

The public press every now and then features some sob story and I conclude from reading these that most every fair damsel who marries without love a wealthy man or otherwise loses her virtue, does so to get the money to pay for an operation of her dear mother or father. We know the absurdity of such stories but such is the food upon which our public is fed.

The Bar Association recently announced and is putting on a publicity campaign, frankly to the public, to enlighten them as to the aims and ambitions of the legal profession. I have confidence in our profession and confidence in the public, and, were our mutual problems better understood, I believe that much of the present criticism and suspicion directed at us would be cleared up.

We need more members of our profession in public office, national, state and local governments. It appears to have been the policy of our profession to raise the eyebrow and disparage unselfish service of our doctors in public office. We need and should encourage members of our profession to represent us where laws are made and public policies determined and not to refer to them as "political doctors." The legal profession has no trouble in getting any legislation they need, because they are on the ground with their personal contacts and votes.

Specialization.—Is there anyone who will deny that this feature of the practise of medicine has been overdone? When times were booming and money burning to be spent, the public took rather kindly to this innovation, as it flattered their vanity and gave them much topic of conversation at the afternoon tea table. Now things are different and the public are looking again for the extinct family doctor. The specialist should be a promoted or a postgraduate practitioner of years' experience in treating the body as a whole and the general ensemble not forgotten when his work is later confined to the consideration of a finely divided portion of the whole. The sudden bursting forth of the sprout of specialization within a short time of graduation, often leads me to conclude that the roots are sustaining nourishment from the top soil of ease and office practise at substantial fees, rather than dipping deep in the subsoil of experience, sacrifice and hard work, which after all tends to produce the most perfect flower of professional attainment. Certainly the well prepared and well grounded specialist is a necessity and a life saver for the general man, when special skill and knowledge is necessary in the diagnosis and treatment of obscure conditions.

The general public, in many instances, have been frightened by the elaborate details and the expense of the physical check-up, given in late years, especially by the clinic groups. They are often told by this specialist that the cardiograph is off a wave or two, by another specialist that the output of urea is deficient, by another that the nasal septum is deviated, etc., etc., until they finish their examination in fear and trembling. Strange to say they continue to live and, after a few months of worry, discover that life is still sweet and reasonably satisfactory. They are apt not to return as patients.

You remember the old campaign slogan, "What this country needs is a good five-cent cigar." I think what the public wants is a fairly good check-up of their essential physical findings for $5.00 by their family physician. If a patient comes into a doctor's office and states that he wants a complete examination and X-ray studies, I believe it would be good business, at that point, to tell him what he may expect in the way of a charge. If he then still wishes to go ahead, and many such examinations are necessary or may be discovered to be so by his physician, he is in no position to cry robber when he receives his bill.

Ultra-refinement in diagnosis and an untreated mental state of the anxious and worried patient, is the greatest factor that drives our patients to the various cults, who actually take the time and sometimes physical effort in doing something for the immediate symptoms, of which the patient complains. They universally breathe hope, courage and an infinite confidence in a cure. How often, indeed, this is the cure!

Dr. Angell, President of Yale University, in a recent address lamented the passing of the country doctor and said "that by no means least of the remedies he carried was the confidence he inspired. Even in these days of scientific knowledge of bacteria, surgery and the like, modern medicine must recognize the intrinsic significance of the emotional and psychic factors in human health. The quality of inspiring confidence the country doctor had in abundance, as he had the qualities of energy and devotion to a profession at once arduous and poorly recompensed. And fortunate it is that, away from the large cities, the old time country doctor has not been entirely supplanted by the specialist." I contend that the great bulk of our city doctors still come under the classification of the general practitioner and he is just as conscientious and certainly more capable than the old time country doctor, praised in song and prose. He just is not heard from to the same extent as is the specialist, and has both the good grace and common sense to keep from bursting forth into print in condemnation of his brethren. I have practised medicine in this city for twenty-five years, to be sure, most inconspicuously and possibly unworthily, but I am proud of the character, the unselfish services and the scientific skill of the average man with whom I have come in contact. I know of no other profession or group of men with whom I would rather associate or to whom more honor is deservedly due.

Ethics.—This is a word I wish we could drop from our professional vocabulary. It is to the general public like waving a red flag in the face of a bull. It should not be so. After all, ethics are necessary and are only a proper code that gentlemen of a noble profession should use in their daily intercourse with one another. But to the public, it is something mysterious, secretive, and a vague device, promoted by the members of the medical profession to better protect their own interests and to cover up their supposed mistakes.

If we wish to take the trouble, we could do much to explain this to the public, in our daily contact with them. I, personally, try never to use the word. For instance, it is easy to explain to a patient, if they want to change doctors, that it is a privilege well within their rights, and not to say, "Our ethics demand such and such a procedure." Rather tell them that the proper and polite thing to do, is to call up their doctor and tell him how they feel, pay his bill and then go ahead and employ the physician of their choice. This is no different from most other professions and many commercial institutions.

The greatest mistake a doctor makes, is when he tries to stay on a case where he is not wanted, or when someone else is desired in his place. A courteous attitude of the discharged doctor towards the patient and his family, in their request, would do wonders in raising us in public esteem. Sometimes the contrary attitude is employed by the physician and then ethics are blamed. Most complications arise when consultants are called, for the patient usually asks for a consultant with whom he is acquainted, or concerning whom he has heard good reports of his success in treating this particular condition with which the patient is affected. I have never had any great difficulty in sensing a situation in which I conclude that the patient would prefer to have the consultant take charge of the case and I do not hesitate to tell the patient and consultant that, if it is agreeable to both, I would prefer to have the consultant take charge. If the consultant shows evidence of promoting this change, I do not call him again.

We would do much nowadays, when so many patients of other doctors are seen in making out insurance examinations, X-ray reports in injury claims, etc., often in the absence of the attending physician, if we would take the trouble to say to the patient, "You are fortunate in having Dr. John Doe attending you, as he is an exceptionally fine doctor," or words to that effect. This sort of a compliment pleases the patient, surely helps the doctor, and, by helping the other fellow, we do most to help our profession as a whole. Suppose Dr. John Doe does not belong to the select few who stand at the head of our profession—still he belongs to the great majority of us who are just plain doctors. Even the law protects us common fellows by specifying that unusual skill is not essential in the treatment of a case, but that the practitioner need be able only to practise and to use the judgment of the average practitioner of medicine. Our supply of supermen is, after all, rather limited.

Hospitals.—After interviewing the superintendents of several of our local hospitals, I find that these organizations are generally facing serious problems, their occupancy being only from forty to sixty per cent of normal. Several years ago the city specialist decided that the more or less usual custom of joint fees with the country doctor was unethical and, therefore, should be abolished. This was done. The country doctors quickly retaliated, as is human nature, by putting a few beds in his home and his wife-nurse, with one or two other helpers, cared for his patients at home. Thus developed the country hospitals all over this northwest and they are good ones and their staffs are composed of well trained men. The public like this arrangement and our city hospitals have now about one-tenth of their former country patrons. In short, the country hospital and the country doctor have the business and we city doctors have our virtue. Both should be satisfied.

This was followed by the increasing tendency of the general public to accept, as part of their rights from the government, free treatment and hospitalization, by the charity or semi-charity institutions of the state and municipality. I have made an investigation of the public and private hospitals in Minneapolis and I find that the bed occupancy of the private hospital has been gradually declining over a period of the past ten years, while the tax-supported charity or semi-charity hospital beds have enormously increased. For instance, the University hospital admissions have increased in ten years, from 2,444 in 1921 to 6,437 in 1931. The General Hospital beds have increased ten to fifteen per cent in ten years and the outpatient department from two hundred a day to approximately four hundred and fifty a day. Figures on the Veterans Bureau Hospital are not of use, as they are not confined to local cases. We know the general situation in that regard and we know that the ability of the patient to pay his own way does not in the least bar his admission.

Then along comes our present depression to increase the private hospital vacancies and decrease the income of the doctors and nurses. The very poor are well provided for, as are the well-to-do. The average white collared man, who has an equity in his home and a small savings account, is the man who is now hit. Lincoln said, "God must have loved the common man for he made so many of them." These are the great proportion of the general public for whom we should make some effort to provide. I believe now is the ideal time for our hospitals and our profession to provide ways and means whereby this class of patient can be accommodated.

I believe that this should be done by an open advertising campaign to the public. That our hospitals should place a minimum charge upon their ward beds only, for the man with limited means. That nurses now out of employment and in actual want, and there are many such, could be hired by the hospitals to help care for these patients, if necessary, under group care and never one nurse confined to one patient, as is now our absurd custom. The entire financial arrangement should be handled by one wise individual at each hospital, who, through a frank talk with the patient and with outside investigation if necessary, would determine the fee that this individual could pay for his hospital service, together with the staff charge for such medical and surgical attention as might be needed. Again I say, I do not intend this service for anyone but the man who does not want to become a public charge, but who can pay a reasonable small fee for hospitalization and staff care. The man who has his regular job and adequate resources should be encouraged to take the most expensive accommodations at the hospitals, employ three private nurses and pay substantial medical fees.

Doctors are home owners and we must remember that any and all burdens we can lift off our charity hospitals, which will be used to their limits this winter in any case, will lighten the burden of taxes upon our homesteads, and will help keep the general public from becoming charity minded, and delay, at least, the present demand for socialization of medicine. Would not these same individuals, whom we may help at this time to retain their self respect, be the same public that we largely will deal with in the coming years when times become better? After all, how better can we help ourselves than by helping others, and by teaching the public the true principles of our profession, wrapped up and disguised as it may be by the manifold skeins of our so-called professional ethics and assailed as it is from within by self anointed and "holier than thou" critics.

Mount Sinai Hospital, New York City, has started what is called "a consultation service" for patients of moderate means. This plan has many desirable features which we might well consider.

Medical Organizations.—Of these we certainly have aplenty, but they are mainly concerned with the scientific side of the practise of medicine and too little concerned with the economic problems, which should go hand in hand with the science of medicine. I quote from the "Medical Profession and the Health Department," edited by Dr. A. J. McLaughlin of the United States Public Health Service. "We speak of the organized medical profession but its organization is little more than provision for periodic meetings for some reading and discussion of papers on scientific subjects. An exaggerated sense of ethics makes many physicians shrink from anything like business organization; yet organization on a business basis, provision for clinic facilities, regulation of fees on a sliding scale basis according to income are absolutely esential, if State medicine is to be prevented."

I would like to see our own local organizations devote more time and study to economic conditions affecting our profession and there should still be sufficient time left for the consideration of the scientific. The old instructions as to how to "skin a cat" began thus, "First, catch your cat." Right now we might well consider how to catch again the confidence of the public. This will be best accomplished when the general practitioner, who makes up the bulk of our profession, more often takes the helm of our medical organizations. We have before our ethics committee now and then numerous minor infractions of our so-called ethics. I woud like to see the publicity traducers of our profession, whether individuals or organizations, brought before organized medicine and asked to prove their blanket accusations against our profession or be made to get out of organized medicine.

I have never observed that a bird got any great degree of satisfaction out of fouling his own nest, even if it did produce some discomfort to his associates. The old timers will remember one morning during a presidential campaign, observing upon the billboards, all over the country, this slogan, "Let's be through with wibble and wobble." I would like to see on every bulletin board of every medical meeting place in this country the following paraphrase of the above, "Let's be through with squibble and squabble." One of our old and respected physicians once made a remark to me, that holds a world of truth. He said, "I have never, to my knowledge, profited by any misfortune or ill luck of any of my associates, but I do know that I have been helped by any and all of their successes."

Our national and local organizations are fighting a splendid and unselfish battle to stop the plea for additional hospital beds for the care of disabled veterans and the government employees generally, and in the place substitute the care of these patients in private hospitals. Our medical literature is full of this plan and you are well aware of the situation. But not so the general public. The present time appears to me to be the psychological moment to carry this campaign to the general public, who are now tax minded as never before. The work being done by our organizations through the American Legion is effective, no doubt, but the taxpaying general public would be with us to a man, were the situation known. This opportunity may never again occur.

The general taxpayer, as well as the Legionaire taxpayer, of which I am one, is entitled to this information and that quickly. I surmise that our representatives in Congress would welcome hearing from the general public at this time, in spite of the opportunity for political patronage in their districts, were another unit to be obtained there. We have enough doctors in the American Medical Association belonging to civic organizations to put a stop to this program in thirty days, were they let loose.

The constant rise in dues in our medical organizations is causing an increasing number of resignations, when organization is needed now more than ever. Would not more attention to economic conditions and consideration of practical problems affecting the profession help to hold our members together and make them feel that our organization is alive and interested in the welfare of the individual members, economically, as well as scientifically?

RÉSUMÉ

1. Can we not as a profession, by our better

conduct, organized effort and study along economic lines, improve our status and that of the hospitals and nurses with the general public and at the same time render a better and more efficient service?

2. Private medicine stands at the bar of public opinion awaiting their verdict. State medicine is impatiently hoping for a verdict of "Guilty."

3. Self appointed, self serving and self advertising character witnesses out of our own profession are helping the jury to decide against us.

4. As one of the inconspicuous attorneys for the defense, I plead that the great majority of private physicians, in all branches of our profession, are doing their work honestly, conscientiously and capably and any substitute of socialized medicine will result in deterioration of service and profession.

5. As a profession let's cheer up and boost, criticize not at all in public, and spank, if necessary, in private.

THE TREATMENT OF CLUB FEET (TALIPES EQUINO VARUS) IN INFANTS

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THE treatment of club feet has been one of the oldest requirements of surgery. Many methods have come and gone, and in careful observation of the literature, while the principle of treatment is somewhat constant, the real course of treatment has not been definitely outlined nor has it been constant in procedure.

Nothing new is claimed for the method outlined, but the results of such procedure have been so much more gratifying and universally more satisfactory than other methods, after years of trial, that it is always used in infants.

The different methods now in use, some quite satisfactory as to end-results, and others perhaps not well carried out with most unsatisfactory endings and quite constant atrophy, limited motion and only partial correction of deformity, I believe make this method worthy of attention.

In many instances, with much less trouble, it is possible to get as an end-result a foot that, at the expense of motion, atrophy, and bony displacement, looks well when covered by a shoe. In a few cases this may be the only end-result possible. The method outlined is applicable to practically all cases as beginning treatment and has the following advantages:

1. Correction of deformity.
2. Preservation of motion of foot.
3. Prevention of marked atrophy of leg and foot.
4. Use of absolute retentive apparatus and dressings for the least possible time.
5. Avoidance of extensive operation.
6. Simplicity of procedure.

The various degrees and types of talipes equino varus are many, but for treatment with prognosis and end-results, my cases are divided into three classes:

1. Cases of easy correction with or without some bony deformity, excluding bony fusion or absence of bone.

2. Cases of difficult correction with definite contraction of tissue and with or without some bony deformity, excluding bony fusion or absence of bone.

3. Cases with definite contraction of soft parts, bony fusion of joints, absence of bone or hypertrophy of bone.

Cases in Class 1 are common and in this class a cure is expected without surgery of any sort, and usually the case is cured before the weight-bearing period.

Cure is expected in cases under Class 2 with the aid of only a simple operation, the child being free from all apparatus before the age of two years.

Cases in Class 3 are seldom met, and while the general contour of the foot may be greatly benefited by outlined treatment, extensive surgical procedures may of necessity be used to secure a serviceable foot.

METHOD OF TREATMENT

To successfully carry out the treatment, some experience in the use of the plaster-of-Paris bandage in the manufacture of a splint is required. A willing and intelligent mother or nurse and of necessity much patience, time and coöperation are also required.

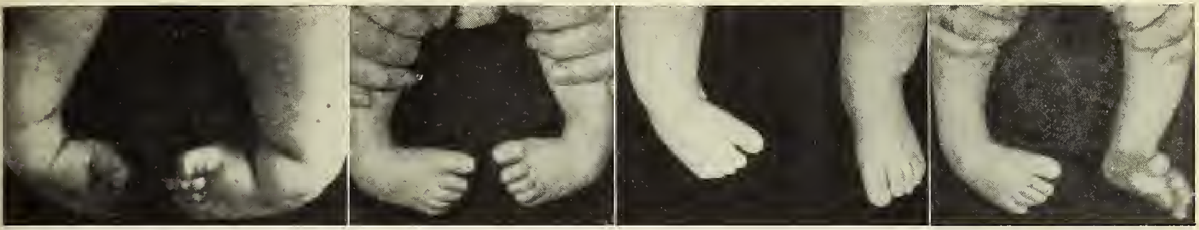

Fig. 1. Typical examples of types of talipes equino varus in infants at first examination.

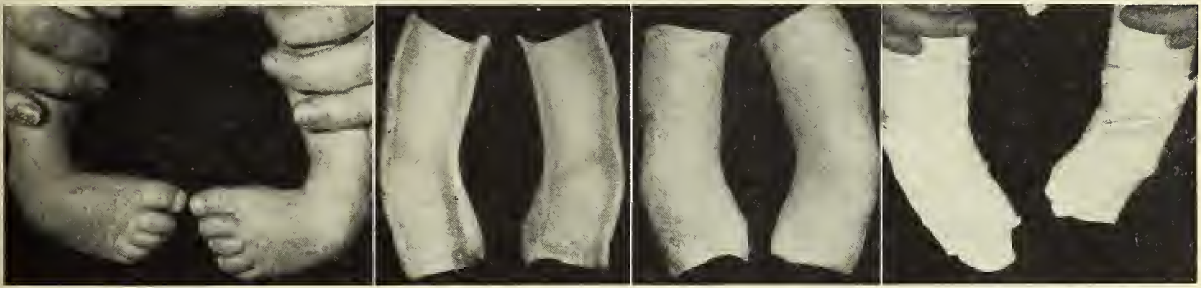

Fig. 2 *(left)*. Typical talipes equino varus; *(center)*, plaster splints ready for application; *(right)*, plaster splints as applied by mother with bandages.

Treatment proper is begun usually at the end of the second or third week of the infant's life. Some gentle manipulation and massage can be used to advantage under proper instruction even before this time. The infant should be gaining in weight and healthy when treatment is started.

The surgeon's part is essentially an office procedure and consists of the manufacture of splints that can be removed and reapplied in simple manner by the mother or nurse. Materials other than plaster-of-Paris have been used, but, because of its availability, plaster-of-Paris has been my choice. Metal splints, moulding felt or dental vulcanite can be used.

Detail of Manufacture of Plaster Splint.—The infant's foot and leg are covered with oil and the varus deformity is gently and firmly overcome as much as possible without force. A lead strip ⅛ inch thick and ¾ inch wide is moulded over the anterior surface of foot and leg and the parts from tip of great toe to knee are carefully and firmly encased in the plaster. Only the varus deformity is overcome by the first application and the foot is held in the corrected position until the plaster is set. Usually only two or three bandages two inches by six feet are used. The cast is then cut over the strip and the cast and lead removed and at once a large portion, almost the anterior half of the cast, is cut away, leaving a small portion covering the great toe. The outer side is cut away enough so that the heel can be slipped into the well defined sulcus. The splint is made smooth, dried, and then painted with paraffin or shellac.

In the average case three or four dressings at intervals of six weeks are necessary to overcome the varus. We feel that after the varus has been overcome, the os calcis has gone back under the foot, the neck of the astragalus is pointing in the normal direction and the body of the astragalus is under the tibia. The bony deformity in the average case is in a position to rapidly approach normal alignment.

The mother or nurse is instructed to apply a stocking or stockinette to the baby's foot. At the office, the splint is applied several times until the mother is sure of the method. A cloth elastic Ace bandage or flannel bandage covers the cast, foot and leg to hold the splint in the proper position. The splint is removed not less than four times daily for manipulation, stimulation, massage, and exercise. Some twenty-five to fifty definite manipulations for overcoming the varus are taught. Touching the foot with a brush or the finger-tips is used to stimulate muscular contraction. Massage in the form of gentle firm motion over the leg and foot and over the contracted parts is given three to five minutes four times daily. The splint and stocking are removed at bath time for an hour for normal exercise and motion of the foot.

Treatment after Varus Deformity has been Corrected.—Varus deformity is considered as overcome when the foot and great toe can be held out easily ten to fifteen degrees beyond a straight line from center of leg.

Treatment then consists as follows:

1. A splint is made in same manner, but the inner side is left more open and the outer side comes up over the malleolus, a deep sulcus being left for the heel.
2. The mother or nurse are instructed as to:
   a. Application of the splint.
   b. Manipulation to include stretching of the plantar tissue and the tendo achillis group.
3. Massage is continued as before.
4. The apparatus is removed as before at the bath period.
5. Muscle stimulation is produced by finger or brush to especially invite contraction of the peronei muscles and the extensors of the toes.

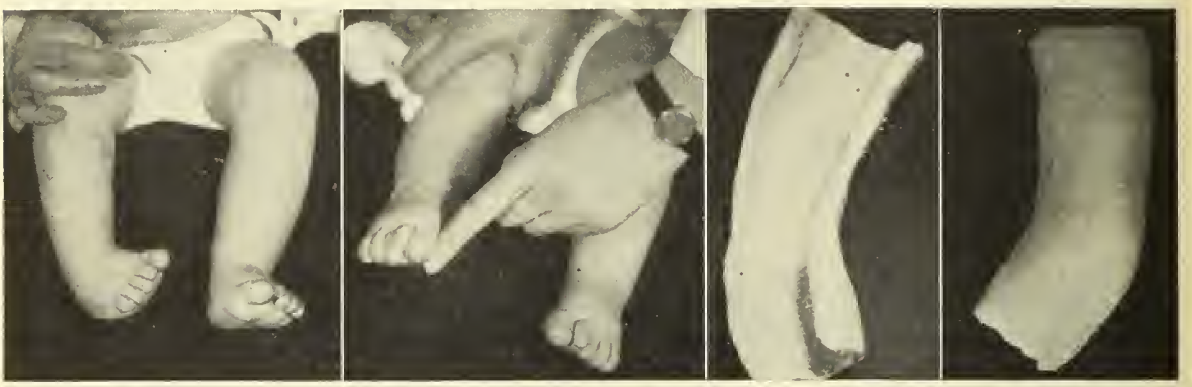

Fig. 3. Typical talipes equino varus showing correction of varus at time of making of first splint. Third and fourth views show splints used in this case.

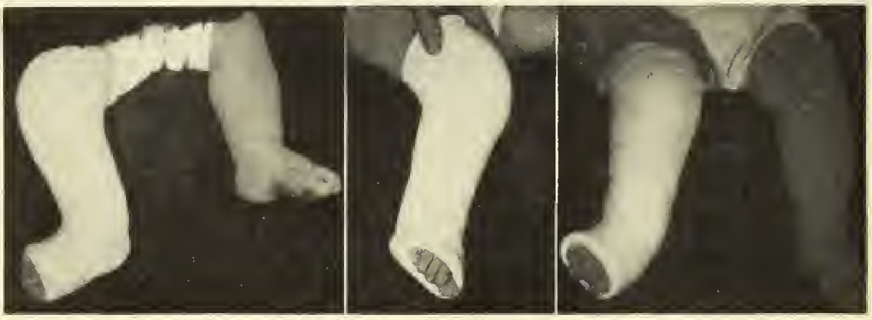

Fig. 4. Examples of correction of deformity at time of minor operation. Foot is in position of calcaneous valgus, cast extending above knee to prevent or correct torsion of tibia.

Progress is usually slower during this period, but the foot is in such a position that deformity of the bones and joints will not occur.

This period continues until the child shows signs of standing or weight-bearing. Creeping and crawling are prohibited because frequently the tibia is likely to become twisted internally by the position usually maintained by the foot while this exercise is in progress.

Usually four or more splints are required for this period.

If at this time torsion or bowing of the tibia is present, one or two splints are made long enough to include at least four inches of the thigh and encircle the thigh slightly more than half, continuing the correction of the equinus and also keeping the foot in valgus to overcome any torsion.

TREATMENT OF INFANTS IN EARLY WEIGHT-BEARING PERIOD, NINE TO FIFTEEN MONTHS

1. In cases well corrected.

Many of these patients stand and bear their weight perfectly and use a splint usually extending above the knee at this period only when sleeping. Often the shoe is wedged on the outer sole ⅛ to ⅜ inch to overcorrect the position of the foot. A small side iron brace in used in cases where muscle power, especially of the peronei is slow in developing. Often only observation during this period is necessary, as many are cured long before the advent of the weight-bearing period.

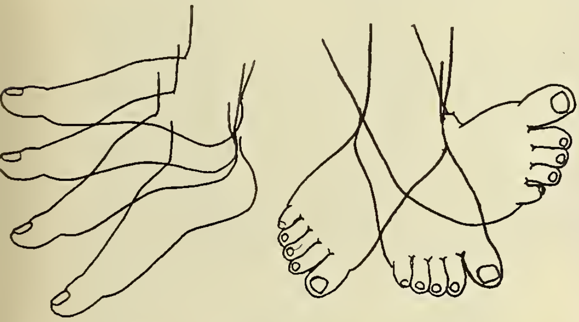

Fig. 5. Schematic drawings showing gradual correction of equinus deformity.

2. Cases not corrected at weight-bearing period.

If either the varus or equinus deformity is not correct at the time the child shows signs of weight-bearing, the deformity must be corrected by surgical means. In all cases where there is no bony fusion, nor hypertrophy of bone present, the deformity is of the soft parts and can be overcome, after months of the treatment outlined, by simple surgical procedure.

In non-corrected cases at this age we find a contracted tendo achillis and plantar fascia the prime factors in preventing complete correction by the splinting, manipulative, massage and exercise method.

The child is not allowed to bear weight on a foot that is not well overcorrected both as to the varus and equinus deformity. Weight-bearing with the foot in an overcorrected position is most valuable in changing the shape of the deformed bones and joints, and walking even a few weeks with the foot in an undercorrected position will often add months to treatment and may defeat the object of this simple procedure.

OPERATIVE PROCEDURE IN CASES NOT RELIEVED BY SPLINTING, MASSAGE, MANIPULATION AND EXERCISE AT WEIGHT-BEARING AGE, NINE TO FIFTEEN MONTHS

In cases where manipulation, splinting, massage and exercise have not overcorrected the de-

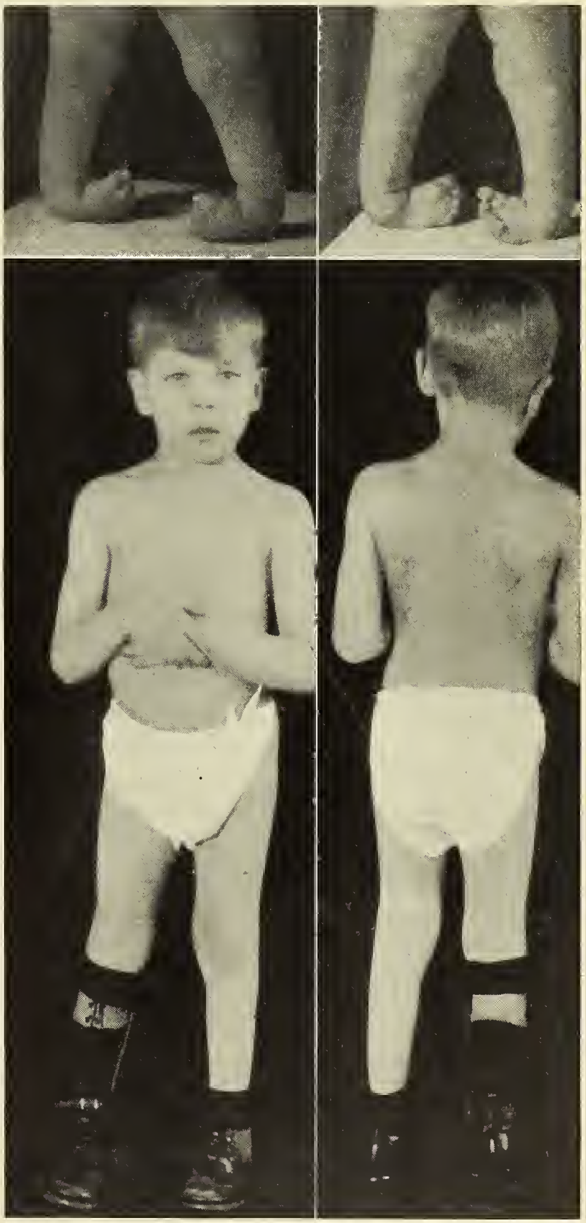

Fig. 6. Typical club feet improved by simple procedure, wearing side iron brace with outer edge of shoe thickened, right foot.

formity, it is usual that contraction of the soft parts is found. The contracted tendo achillis group of muscles is the factor to be overcome in the equinus deformity. This contraction is relieved by the subcutaneous method of tenotomy and myotomy. The contracted group is divided high up near the junction of the muscle and the beginning of the tendon. Tension is maintained while the tenotome saws the muscle and tendon in several places.

The plantar fascia may tend to prevent correction of the equinus and varus and again by subcutaneous incision with tenotomy just anterior to the insertion on the os calcis, the fascia is lengthened.

Only rarely are the flexor tendons of the toes lengthened by subcutaneous section near the base of toes.

The foot is gently manipulated into an overcorrected position. No great manipulative force is used, and extreme overcorrection and manipulation are inadvisable and not necessary.

Sterile gauze is placed over the wounds, sheet wadding or a stockinette is applied and a plaster dressing which is worn for six weeks. The plaster cast extends from the base of the toes to three inches above the knee, the foot being held in an overcorrected position of calcaneus valgus.

Weight bearing is encouraged two weeks after the operation.

A second plaster is applied from the toes to the knees and worn for four weeks. Weight-bearing and walking are encouraged and the foot still held in calcaneus valgus position.

After removel of the second cast, a walking apparatus, with a wedged shoe and, if the muscles are weak, a side iron brace, is used with continued massage, manipulation and exercise. Creeping is prohibited because of tendency to cause torsion of the tibia.

Observation of a case is important and the child is seen at six-weeks to two-months intervals until the age of two or assurance that the deformity is remaining corrected.

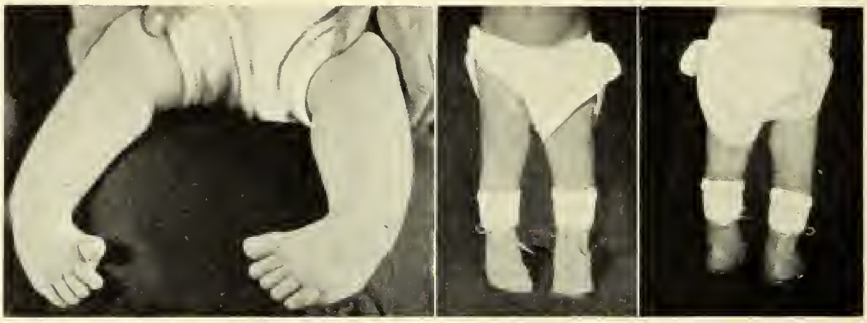

Fig. 7. First view—typical club feet. Second and third views—application of wedged shoes when child begins to walk.

The infant with marked bony defects obvious to external and X-ray examination is only the rare case and not in the usual class under discussion in this paper, but is in my experience best treated by this harmless method, prolonging the bony operation until the child is of such age that the least possible damage is done to bone and soft parts by operation necessary to correct such deformity.

Under no circumstances is the infant dismissed as cured until after the foot has been used for walking several months. Walking or weight-bearing is not allowed until the foot is in a normal, overcorrected position, as weight-bearing with the foot in proper position causes change in the bones and shape of bones not possible to obtain in any other manner and is most important in perfecting the cure.

With certain other methods where forced manipulation and early operation require absolute retentive apparatus, it is not possible to remove the apparatus for daily manipulation from the time of operation until after the weight-bearing age.

Coincident with long continued absolute retentive apparatus, marked atrophy, inability to use muscles, and loss of motion are the usual results: while by the method described, absolute retentive apparatus is used only during the first ten weeks of weight-bearing and avoids in the greater part marked changes and disability as the result of the methods just mentioned.

The successful treatment of club foot is not easy and the fact that its routine is not well understood is evidenced by numerous examples seen not only at public and state institutions, but in private practice, where deformity, marked atrophy, disability, limited motion, scars, contracted bands and pressure sores with the usual history of radical operations and severe manipulation even in the first few weeks of life, with history of long continued retentive apparatus as the causative factors in the poor and characteristic end-result.

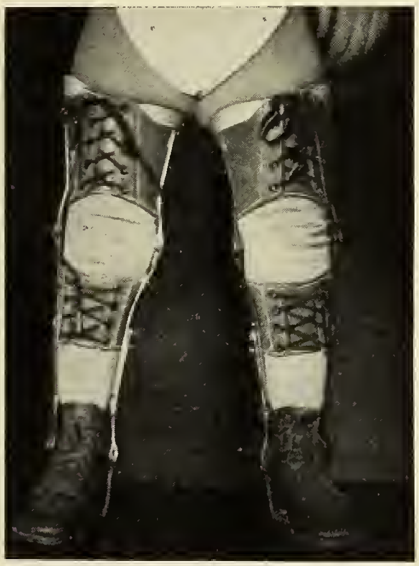

Fig. 8. Typical braces with joints at knee and ankle, used when torsion of the tibia is marked.

I submit this simple method well knowing if faithfully carried out by surgeon and parent, at least it is a method that has, in my experience, proved most satisfactory without the possibility of the above named common experiences which usually hinder the average chance of a good functional result.

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A STUDY OF THE INCIDENCE OF AURICULAR FIBRILLATION*

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AURICULAR fibrillation (delirium cordis, or pulsus irregularis perpetuus, total irregularity, or irregular irregularity) continues to be the most frequent of the significant forms of cardiac arrhythmia.

A study has been made of the records of 1,045 consecutive cases of auricular fibrillation, to ascertain the incidence of the etiologic factors or the conditions commonly and remotely associated with auricular fibrillation. To all intents and purposes these conditions may be considered etiologic. The diagnosis of auricular fibrillation has been made by means of the electrocardiogram in each instance. In most of these cases the fibrillation was chronic. A small proportion of the patients had intermittent auricular fibrillation; this was especially true of those who had hyperthyroidism.

It will be noted, in Table 1, that chronic rheumatic endocarditis with mitral stenosis was the clinical diagnosis most commonly associated with auricular fibrillation. That held true if exophthalmic and adenomatous goiter with hyperthyroidism each was listed under a separate head, and if coronary and hypertensive heart disease each was put in a different group. However, if exophthalmic goiter and adenomatous goiter with hyperthyroidism were classified together under one head, and if hypertension and coronary heart disease were listed under one head, chronic rheumatic endocarditis with mitral stenosis came third in the list (Table 2). Considered from this viewpoint, hypertensive and coronary heart disease heads the list of causes of auricular fibrillation, or of conditions associated with it, with a frequency of 33.9 per cent. Hyperthyroidism was a close second, with 32 per cent and chronic rheumatic endocarditis with mitral stenosis came third with 22 per cent. In Table 2 it will be noted that hypertensive and coronary heart disease taken together, hyperthyroidism, and chronic rheumatic endocarditis with mitral stenosis were the three most common causes of auricular fibrillation. Next in frequency came a group of cases in which the etiology could not be determined. In this group there were eighty-one cases, in sixty-one of which there were cardiac symptoms, and in twenty, no cardiac symptoms other than irregularity. A few of the patients whose cardiac action was irregular were not even aware of it. Cardiac symptoms, when present, were in some cases very mild; in others, they were those of severe congestive failure.

The remaining classifications in Table 2 are self-explanatory. However, concerning the ninth classification: it is generally known that auricular fibrillation is a relatively rare accompaniment of cases of subacute bacterial endocarditis. Why this should be is not explained. One would naturally expect it to occur commonly, because a relatively large number of cases of subacute bacterial endocarditis is engrafted on old, especially on mild, chronic rheumatic endocarditis with mitral stenosis, and auricular fibrillation is frequently associated with chronic rheumatic endocarditis with mitral stenosis; in fact, auricular fibrillation accompanies this condition in the highest relative incidence, as will be seen when Table 3 is analyzed.

It appears, from Table 2, that coronary and hypertensive heart disease, hyperthyroidism, and chronic rheumatic endocarditis with mitral stenosis are the three most common causes of auricular fibrillation. But this table was constructed on a basis of consecutive cases of auricular fibrillation seen at the clinic. However, more cases of hypertension and coronary disease were seen than were seen of cases of hyperthyroidism, and so on. It was desired to determine the actual proportion of cases of hypertensive and coronary disease, of hyperthyroidism, of mitral stenosis, and so forth, in which auricular fibrillation would be found. Therefore, a group of 100 cases of chronic rheumatic endocarditis with mitral stenosis, taken consecutively as the patients concerned registered at the clinic, was studied (Table 3). In a small proportion of them, necropsy was performed. There were

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*From the Section on Cardiology, The Mayo Clinic, Rochester, Minnesota. Submitted for publication March 1, 1932.

TABLE 1

RELATIVE INCIDENCE OF ETIOLOGIC DISEASES IN 1,045 CASES OF AURICULAR FIBRILLATION

	Incidence	Per cent
1. Chronic rheumatic endocarditis with mitral stenosis	230	22.0
2. Exophthalmic goiter	174	16.0
3. Coronary disease alone	168	15.0
4. Adenomatous goiter with hyperthyroidism	161	15.0
5. Hypertensive and coronary heart disease	105	10.0
6. Hypertensive heart disease alone	82	7.8
7. Indeterminate*	81	7.7
8. Pericarditis	16	1.5
9. Chronic rheumatic endocarditis with aortic stenosis	9	0.8
10. Aortic insufficiency (rheumatic)	9	0.8
11. Syphilitic aortitis	8	0.7
12. Subacute bacterial endocarditis	2	0.019
Total	1,045	

*The diagnosis was auricular fibrillation, but the etiology was undetermined.

TABLE 2

RELATIVE INCIDENCE OF ETIOLOGIC DISEASES IN 1,045 CASES OF AURICULAR FIBRILLATION*

	Incidence	Per cent
1. Hypertensive and coronary disease	355	33.9
2. Adenomatous goiter with hyperthyroidism and exophthalmic goiter	335	32.0
3. Chronic rheumatic endocarditis with mitral stenosis	230	22.0
4. Indeterminate	81	7.7
5. Pericarditis	16	1.5
6. Chronic aortic endocarditis with aortic stenosis	9	0.8
7. Chronic rheumatic aortic endocarditis with aortic insufficiency (rheumatic)	9	0.8
8. Syphilitic aortitis	8	0.7
9. Subacute bacterial endocarditis	2	0.019

*Items 3, 5 and 6 of Table 1 combined as item 1 of this table; items 2 and 4 of Table 1 combined as item 2 of this table.

twenty cases of auricular fibrillation. In a study of another series of forty-nine cases of chronic rheumatic endocarditis with mitral stenosis, in all of which necropsy was performed, auricular fibrillation occurred in twenty cases (40 per cent). I think the difference between twenty and forty is about what would be expected, because the longer any cardiac disease exists, and the more severe it is, the more likely it is that fibrillation would occur. A patient who has come to necropsy obviously has had the disease for the maximal time that is compatible with life for him. This is probably why the frequency of auricular fibrillation in the forty-nine cases in which necropsy was performed was twice as high as in the group of 100 cases, in few of which necropsy was performed.

In a group of 205 cases of adenomatous goiter with hyperthyroidism (Table 3), selected and studied the same way, it was found that auricular fibrillation occurred in twenty-nine cases (14 per cent). The next group studied was 144 cases of chronic adherent pericarditis; in this group, only cases in which necropsy was performed were used, because of the high percentage of error in the clinical diagnosis of this condition. In drawing conclusions based on a series of cases in which neccropsy was performed with a series in which the data are obtained mainly by clinical means, this fact must be kept in mind. It is to be expected that in the series of cases in which necropsy was performed, the percentage of auricular fibrillation will be higher. There were several cases in which an associated valvular disease existed, especially mitral stenosis. This, too, would probably account for the high proportion of cases of auricular fibrillation. These two reasons—that necropsy was performed and that mitral endocarditis and mitral stenosis were associated—probably explain why this group comes third in Table 3. The remaining entries in Table 3 require no comment, except to say that in the 113 cases of pericarditis with effusion, necropsy was performed in each case.

In Table 3, it will be noted that the incidence of auricular fibrillation among patients who had

TABLE 3

INCIDENCE OF AURICULAR FIBRILLATION IN CONSECUTIVE CASES OF DISEASES WHICH MAY CAUSE AURICULAR FIBRILLATION

Diagnosis	Cases	Auricular fibrillation	
		Incidence	Per cent
Chronic rheumatic endocarditis with mitral stenosis*	100	20	20.0
Adenomatous goiter with hyperthyroidism	205	29	14.0
Chronic adhesive pericarditis**	144	18	12.0
Aortic stenosis	100	8	8.0
Exophthalmic goiter	203	10	4.9
Aortic insufficiency (rheumatic)	100	4	4.0
Syphilitic aortitis	100	4	4.0
Hypertensive heart disease	100	4	4.0
Pericarditis with effusion	113	4	3.5
Coronary sclerosis	100	3	3.0
Congenital heart disease	100	2	2.0
Subacute bacterial endocarditis	100	1	1.0

*In another series of forty-nine cases in which necropsy was performed auricular fibrillation occurred twenty times (40 per cent).

**Necropsy performed in all cases.

TABLE 4

INCIDENCE OF AURICULAR FIBRILLATION IN CASES REPRESENTING A PARTICULAR AGE GROUP

Diagnosis	Cases	Age-group	Auricular fibrillation	
			Incidence	Per cent
Adenomatous goiter with hyperthyroidism	50	50–60	7	14
Exophthalmic goiter	50	50–60	5	10

adenomatous goiter with hyperthyroidism was almost three times as high as that among patients who had exophthalmic goiter. It was believed that the reason for this was that adenomatous goiter with hyperthyroidism generally occurs among people who are older than those who have exophthalmic goiter. Older people are more likely to have fibrillation from any given cause than are younger persons. Consequently it would be expected that the incidence of auricular fibrillation would be higher in older persons who had either adenomatous goiter or exophthalmic goiter. To determine if this were true, I took a group of fifty cases of adenomatous goiter with hyperthyroidism among patients fifty to sixty years of age (Table 4) and compared the incidence of auricular fibrillation in this group with that in the correspoding group recorded in Table 3. The percentage incidence in the two groups was the same. The reason presumably was that the patients with adenomatous goiter with hyperthyroidism recorded in Table 3 tended to be elderly. However, when a like comparison was made between the corresponding groups of patients who had exophthalmic goiter, the incidence of auricular fibrillation in the group of fifty (Table 4) was found to be considerably higher than that in the group recorded in Table 3. The reason probably was that the patients with exophthalmic goiter who are represented in Table 3 tended to be much younger than fifty to sixty years. It would appear (Table 3) that auricular fibrillation is associated with adenomatous goiter with hyperthyroidism in a higher incidence than it is with exophthalmic goiter. It is believed as has been indicated that this is true mainly because adenomatous goiter with hyperthyroidism tends to afflict older persons than does exophthalmic goiter. There is another factor which possibly may influence this high incidence of auricular fibrillation in association with adenomatous goiter, and that is that patients with adenomatous goiter with hyperthyroidism probably have had their hyperthyroidism continuously over a longer period before they were operated on than patients with exophthalmic goiter, because exophthalmic goiter, as a rule, is a more urgent condition.

The incidence of auricular fibrillation found in this study has varied somewhat from that of other workers, although the results obtained compare fairly closely with those of McEachern and Baker. In their study they found that rheumatic heart disease constituted the largest single group of cases, with a percentage of 34.4, but they classified hypertension and arteriosclerosis under separate heads. Hyperthyroidism constituted only 7.5 per cent of their series, whereas it accounted for 32 per cent of my series.

SUMMARY AND CONCLUSIONS

In a series of 1,045 consecutive cases of auricular fibrillation, the associated or causative conditions which occurred in highest incidence were hypertensive and coronary heart disease (Table 2). The incidence of this combined condition was represented by 33.9 per cent. Hyperthyroidism occurred second in frequency, with 32 per cent. Mitral stenosis (mitral endocarditis with stenosis and insufficiency) occurred third in frequency, with a percentage of 22. However, among consecutive cases of diseases which are known often to be accompanied by auricular fibrillation, mitral stenosis (mitral endocarditis with stenosis and insufficiency) was found to be accompanied by auricular fibrillation in higher proportion than any of the other diseases (Table 3).

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ANGINA PECTORIS: HISTORY, ETIOLOGY AND MECHANISM*

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ANGINA pectoris has been afforded the distinction of being considered a disease by some observers and a symptom by others. Owing to the fact that angina pectoris comprises a group of symptoms and results from several pathologic processes, present-day nomenclature has designated the term anginal syndrome, as descriptive, but whenever possible the name of the etiologic disease is used. For example, one speaks of the anginal syndrome due to coronary sclerosis, or the anginal syndrome due to atresia of the coronary orifices secondary to syphilitic aortitis. By this practice the diagnosis of cardiac diseases is made with much greater accuracy and comprehensiveness.

The scope of this paper does not permit detailed consideration of the historic background of angina pectoris, and therefore only some of the most important contributions will be mentioned, which in reality are landmarks in the progress of knowledge of this condition. In 1700, Drelincourt recorded what appears to have been the first recognition of coronary sclerosis, and three years later Bellini associated myocardial disease with coronary sclerosis. In 1768, Heberden wrote his description of the anginal syndrome so accurately and completely that it stands today as a masterpiece. In 1794, John Hunter described the disease which afflicted him in a manner possible only to one who had experienced the pangs of angina pectoris. In 1799, Parry, a contemporary of John Hunter, recognized coronary sclerosis clinically. Parry was intimately associated with John Hunter's physician, Jenner. In 1815, Hodgson called attention to the relationship of sudden death to coronary disease. In 1827, Adams described what certainly was cardiac infarction, but apparently he did not appreciate its cause or origin. In 1850, Creveilhier gave the first comprehensive review of coronary thrombosis and cardiac infarction. In 1889, Huchard presented a dissertation on angina pectoris, and reviewed the current historical theories. He related angina pectoris to coronary disease and to aortic disease. In 1896, Dock was the first observer in America to describe coronary thrombosis, and in 1912, Herrick clearly described the condition and reported the case of a patient who recovered. In 1914, Mackenzie emphasized the part played by the coronary arteries in angina pectoris, and called attention to fatigue of the heart muscle in the causation of the attacks. In 1915, Allbutt refuted the hypothesis that coronary disease is a cause of angina, and was of the opinion that the aorta was solely concerned. He believed that irritation of the nerve endings in the adventitia, particularly of the first portion of the aorta, was the cause of the painful seizures.

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*From the Section on Cardiology, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota Society of Internal Medicine, St. Paul, Minnesota, November 9, 1931.

This hypothesis for a time received widespread recognition, but in succeeding years attention has been directed, again, to the coronary circulation.

ETIOLOGY

The anginal syndrome is preëminently identified with coronary arterial disease. Sclerosis of the coronary arteries is the pathologic process most commonly encountered, and is virtually limited to the larger branches. The involvement may be extensive or localized with formation of plaques; it may be obliterative, or it may permit the arteries to remain relatively patent.

Coronary thrombosis and embolism are virtually always accompanied by the anginal syndrome; the pain is more severe and of longer duration and secondary phenomena occur that are absent under other conditions. This fact makes untenable the arguments against the hypothesis that coronary disease is etiologic.

Atresia of the coronary orifices associated with syphilitic aortitis is usually attended by the anginal syndrome. Stenosis of the aortic valve and orifice frequently is attended by painful cardiac seizures, subjectively indistinguishable from those occurring in the course of coronary disease. Narrowing of the aortic orifice renders the coronary circulation imperfect, although the coronary arteries may be normal structurally. Rarely, large vegetative lesions of subacute bacterial endocarditis of the aortic valve may impinge on the coronary orifices and be the cause of the anginal syndrome.

Severe anemia, primary or secondary, may result in imperfect nutrition of the heart and the physiologic counterpart of coronary disease is produced. In certain cases, severe and prolonged paroxysmal tachycardia is attended by the anginal syndrome. Extreme cardiac acceleration is accompanied by a diminished volume output per beat and in attacks of great acceleration, both systolic and diastolic blood pressure fall. The drop in diastolic pressure may be considerable, and it may be impossible constantly to maintain adequate coronary circulation.

The anginal syndrome, then, is primarily dependent on absolute or relative insufficiency of the coronary circulation, as has been noted. When the coronary circulation becomes insufficient, anoxemia of the myocardium occurs, and is one of the significant factors in cardiac fatigue. Associated metabolic disturbances are not definitely understood.

Spasm of the coronary arteries as a cause of the anginal syndrome received considerable attention at the beginning of the present century, and although its existence, and the possibility that it is causal in certain cases cannot be denied, doubt must still be held concerning it.

The mechanism whereby myocardial anoxemia influences the nerve endings to produce pain is not clearly understood, but probably is similar to the production of cramp in voluntary muscles during fatigue.

After the onset of the initial anginal attack, the nervous mechanism appears to become sensitized, so that an arc of abnormal distribution of stimuli becomes established. In the spinal cord a region becomes irritable, which under normal conditions has not been particularly irritable; it may become highly sensitive, in a manner similar to that in which certain portions of the lumbar part of the spinal cord become irritable in normal subjects.

A sensitive, nervous constitution appears to be significant in determining not only the occurrence but the continuation of the anginal syndrome.

TREATMENT OF ASTHMATIC BRONCHITIS WITH IODIZED OIL*

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WHILE the treatment of bronchial asthma due to extrinsic causes is theoretically a matter of removing the offending cause, or of specific desensitization, experience has shown that there is a large group of individuals who do not yield to such treatment or in whom such causes cannot be found. This group includes the cases of so-called "bacterial asthma" or of "asthmatic bronchitis" in which bacterial invasion of the bronchial tree has occurred. Progression from simple asthma to asthma complicated by infection, with bronchitis and emphysema, is not uncommon.

Rackemann[1] states that bacteria can produce asthma in three ways: (1) through a definite allergic effect without reference to other allergens; (2) by modifying sensitiveness to other allergens so that symptoms are produced following exposure to them; and (3) by intensifying the attack of asthma which has started from any cause.

In this group of cases of asthmatic bronchitis are those whose asthma occurs after some acute respiratory infection and is not related to any change in environment or manner of living. The amount of secondary infection may be determined from the cough, sputum, and wheezing present between attacks. The sputum is likely to be thick and purulent in severe cases. Cough is quite marked at the onset of the attack, as contrasted with uncomplicated asthma in which it is present only at the end of a paroxysm.

Various measures of non-specific therapy, such as the use of expectorants, autogenous vaccines, ultra-violet irradiation, X-ray therapy, surgical removal of the sympathetic ganglia, and bronchoscopy with local applications, have been tried with varying results.

The instillation of iodized oil into the bronchial tree as a method of diagnosis and treatment in cases of bronchitis and bronchiectasis has been carried out by Ochsner[2] in more than 1,500 cases, and he has found evidence of some degree of bronchial dilatation in over 90 per cent of these. He found that the iodized oil was of distinct therapeutic value in these cases. The number of organisms in the sputum as determined by actual count was found to decrease progressively. The tendency of lipiodol to cause rapid healing has also been noted in cases of empyema by Ransohoff and Heiman,[3] who injected lipiodol into the residual cavity after treatment of empyema by aspiration drainage and Carrel-Dakin instillations. Similar results were found when it was injected into the seminal vesicles by Belfield and Rolnick.[4]

Caulfield[5] in a similar way has injected gomenol, an essential oil extracted from the Melaleuca plant, in cases of asthmatic bronchitis with definite benefit in 15 out of 17 cases.

I wish to report here two cases of asthmatic bronchitis in which the administration of lipiodol by the passive method has proved of distinct benefit. The method, as described by Ochsner, consists of the production of sensory anesthesia of the anterior tonsillar pillars so that the swallowing reflex is abolished and, after the introduction of a 10 per cent procaine solution as an anesthetic to the tracheobronchial mucosa, the iodized oil is taken on the back of the tongue and enters the pharynx. With the patient in the upright position, it then goes through the superior laryngeal orifice into the trachea. This procedure is probably best carried out by a laryngologist as it was in these cases. The technic, however, is not difficult.

Case 1.—K. W., an unmarried female, age 33, was first seen on October 31, 1927. She had had attacks of bronchitis since childhood and in the past ten years had had numerous asthmatic attacks. In the intervals between attacks she raised moderate amounts of thick sputum. The tonsils had been removed. Physical examination showed a marked emphysema and findings typical of asthmatic bronchitis. Blood pressure was 122/80. X-ray films of the chest were negative. Skin tests showed her to be slightly sensitive to horse dander, rabbit hair, and dog hair. Urinalysis was negative. Sputum specimens showed mixed infection. Diagnostic puncture of the maxillary sinuses showed no evidence of infection. Dental X-ray films showed one devitalized tooth.

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Treatment consisted of the following measures: (1) removal of the devitalized tooth, and (2) administration of an autogenous vaccine prepared from organisms found in the sputum. There was no improvement following this and she suffered from much fatigue and wheezing between the attacks of asthma.

On October 3, 1929, lipiodol was injected into the right bronchial tree. Fluoroscopic examination immediately afterward showed a slight cylindrical dilatation of the bronchi. The injection was repeated on the opposite side a few days later with some difficulty because of coughing and bronchospasm, but this was overcome by the administration of adrenalin hypodermatically. Lipiodol injections were repeated in April and June, 1930.

Since the iodized oil was first injected, the patient has reported only one mild attack of asthma and a few mild attacks of upper respiratory infection. Her sputum has greatly diminished in amount. She has resumed her occupation at full time. Although she still has some dyspnea on moderate exertion, she feels greatly improved.

Case 2.—A male, aged thirty-seven, was first seen February 20, 1928. At various times he had had dermatitis from exposure to primrose. His first attack of asthma occurred in June, 1927, following a respiratory infection. Attacks recurred at intervals of a few months and he had some cough, sputum and shortness of breath between attacks. Physical examination showed a well-developed man with emphysematous chest and coarse râles scattered throughout the lower chest. The tonsils were enlarged and cryptic. Heart tones were normal. The blood pressure was 130/70. Skin tests showed slight positive reaction to cheese, salmon, and horse dander. The sputum showed mixed infection. The blood count was normal throughout except that the differential count showed 7 per cent eosinophiles. The urine was normal. X-ray films of the chest were negative. Irrigation of the maxillary sinuses showed definite evidence of infection and the sinuses were irrigated repeatedly for this. The tonsils were removed.

As the patient showed only temporary improvement following these procedures, it was decided to instil lipiodol into the bronchi and this was done in January, 1930. The injection was repeated in August, 1930, November, 1930, and in March, 1931. X-ray films taken of the chest after the lipiodol instillation showed slight cylindrical dilatation of the bronchi but no evidence of bronchiectasis.

Following the injection he reported much improvement, with great diminution in the number of attacks of upper respiratory infection and asthma. While he is not entirely relieved of his bronchitis, he is nevertheless greatly improved.

These two cases are reported because it is felt that the instillation of iodized oil into the tracheobronchial tree was of marked benefit in them.

It is recognized that in asthma there are many instances of improvement or cure without any appreciable treatment, but I believe that in these cases the lipiodol had a definite effect on the bronchial infection and consequently on the number of asthmatic attacks.

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INULIN

Inulin is a polysaccharide carbohydrate that resembles starch. It occurs in plants as a reserve carbohydrate in a few species that are edible. Foremost is the so-called Jerusalem artichoke, Helianthus tuberosus. Years ago attempts were made to feed Jerusalem artichokes to patients with diabetes because it had been found that the sugar output was not increased thereby. The assumption from such observations, however, that inulin can be utilized satisfactorily by the diabetic patient is by no means justified from such data. Obviously, any carbohydrate that cannot be readily digested would fail to be absorbed and accordingly fail to increase the sugar output. Despite the scientific evidence tending to diminish the probability of successful application of inulin-bearing plants to human nutrition, a number of capable investigators have concluded that Jerusalem artichokes actually improve the tolerance of patients as well as supply some energy that is directly utilized in the diabetic metabolism. Recent investigators believe that the reputed therapeutic value of Jerusalem artichokes in the diet of the diabetic patient, reported frequently by physicians from their personal experience, is based too often on uncontrolled observations and is a result both of over-enthusiasm on the part of the observer and of the tendency of human nature to anticipate results, even at the expense of erroneous conclusions. (Jour. A. M. A., February 6, 1932, p. 483.)

TREATMENT OF CHRONIC MORPHINE INTOXICATION

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THE treatment of chronic morphine intoxication is an important matter, for this disease is one of the major medico-social problems of today. The so-called "morphine addict," or as he should more fittingly be termed, "the individual suffering from chronic morphine intoxication," is met with by every practitioner of medicine; how often one does not know, for it is not necessary that the patient exhibit pin point pupils, tremor of the hands, sallow complexion and moral degradation, and in fact often the closest scrutiny fails to bring to light any one of these symptoms. However, the number of those who apply for treatment of this disease, coupled with those in whom the illness is recognized during examination for other complaints, is considerable.

In the treatment of chronic morphine intoxication, I feel there are four important considerations: (1) The proper attitude of the physician and the patient toward one another; (2) discontinuance of the drug; (3) convalescence in the hospital; and (4) care after discharge from the hospital.

The feeling of the physician in regard to the condition is all important, for out of this grows his reaction to the patient, and from it, to a large extent, evolves the patient's attitude toward both the doctor and his illness.

During recent years a great change in feeling on the part of the physician in regard to "morphinism" has occurred. Where formerly it was generally regarded as a "vice" or "habit," it is now increasingly being recognized as a functional disease. If even a large minority of so-called "addicts" discontinued the use of the drug unaided, through their own efforts, one might rightly hold the majority responsible for not doing likewise, but less than one-fifth of one per cent accomplish this task. The logical explanation of this fact lies in the peculiar properties of the drug which affects the body and mind of the user in such a manner that attempts at discontinuance lead to extreme physical and mental suffering. The depression and mental anguish are intense and horrible in themselves, but moreover, they leave the user in no condition to bear physical pain. This functional disease involves the nervous system primarily, but the glandular system and metabolism are affected as well.

With this knowledge in hand the physician can now approach the problem from a sound point of view. He no longer considers the individual constitutionally inferior, a degenerate, or a potential criminal, but rather the victim of a disease. That this is the proper attitude is borne out by the facts that users are of all ages and of both sexes, and that this condition is not restricted to any social, economic, or intellectual group.

The attitude of the patient toward the doctor must be one of absolute confidence. Nothing engenders this more than a kindly, sympathetic, understanding, yet firm, manner on the part of the medical advisor. The patient must look at his condition as a disease that can be and must be overcome by a thorough coöperation with the physician and a resolute determination upon his (the patient's) part to get well.

With the above in mind, we will pass to a consideration of discontinuance of the drug. There are two general ways of accomplishing this, either by the substitution method or the systematic withdrawal method. The former, consisting of the substitution of cocaine, codein, heroin, opium, or the like for the morphine, has on the whole been abandoned, since the substitution remedies often lead to a new habit which is frequently added to the old. The latter, consisting of systematic withdrawal of the drug under the strictest supervision, is now practiced almost exclusively.

There are three chief ways by which systematic withdrawal may be accomplished. The oldest of these is the gradual withdrawal method, and a few still defend this process in a modified form. It consists of a very gradual reduction in the daily dose of morphine with palliative treatment of the accompanying symptoms. Its advantages are none, while its disadvantages are the exceedingly difficult task of controlling the patient so that he can not secure the drug secretly, prolongation of the abstinence symptoms, and prolonging the total period of treatment.

In 1875, some years after the introduction of this first method, the abrupt withdrawal method was described by Levenstein. This process consists of first placing the patient in strict confinement in an especially equipped hospital with reliable private day and night nurses in constant attendance, and then withdrawing the morphine in its entirety at a single stroke. This procedure has two points in its favor—certainty of success (as to discontinuance of the drug), and rapidity of accomplishment, but the fact that it can be practiced only in special hospitals and, more important still, the ever present danger to life by cardiac collapse offset these advantages.

The rapid withdrawal method introduced by Erlenmeyer in 1883 has had many modifications, and in its various forms is the most common system in use today. The literature contains an unusual number of modifications of Erlenmeyer's treatment, but all embody the same principles, namely, removal of the drug over a period of several days and treatment of the accompanying abstinence symptoms followed by a period of recuperation in the hospital. No attempt will be made to discuss these various modifications in this paper.

The following is an outline of the plan used by us (Riggs, Hengstler, and Gardner) for securing discontinuance of the drug. One cannot prescribe a cut and dried rigid routine schedule for the withdrawal of the morphine, but a general plan may be presented which has proved very satisfactory in our experience.

The patient, having evidenced a firm desire to get well, and an understanding of the attitude of physician or physicians in charge of the case toward himself and his disease, is placed in a hospital. He is isolated from friends and family with absolute restriction of visitors of any kind, and is not allowed to send or receive telephone messages, notes, or mail. His clothes, including his night clothing and bathrobe, are surrendered by him and thoroughly searched, as in his person. Withdrawal proper is then begun, either after a preliminary observation period of twenty-four to forty-eight hours or if there are no contraindications on physical examination, at once. If the physical condition is such that withdrawal seems risky, time for general physical upbuilding must be allowed.

The time for beginning of reduction having been determined, the patient is placed upon a dosage of about one-half the amount of morphine by hypodermic that he states he has been taking, or that observation has shown necessary to maintain his sense of well being. It seems best that this be given in divided doses at a definitely scheduled time, for instance at 6:00 and 10:00 a. m., and at 2:00, 6:00 and 10:00 p. m. The amount of morphine given at each of these hours is not the same, although the amount of solution in the hypodermic is kept constant. The late evening injection is the strongest, to help in securing a good night's rest; the early morning dose next in potency, the early afternoon hypodermic of about the same strength as the first morning dose, and the remaining two injections containing a still smaller amount of the drug. For example, if the average daily dose has been six grains per day, the total given on the first day of withdrawal would be three grains divided as follows: at 6:00 a. m. ¾ grain; at 10:00 a. m. ¼ grain; at 2:00 p. m. ½ grain; at 6:00 p. m. ¼ grain; and at 10:00 p. m. 1¼ grains. On the second day this amount would again be reduced by one half, *i.e.*, to 1½ grains. Each of the five injections is not reduced in strength by the same amount, but rather the relative size of the dose is kept the same, *i.e.*, the late evening dose is the strongest and the early morning injection next in strength as on the previous day. Each day the amount of morphine is reduced by one half of the previous day's total until within a period of several days all the morphine has been discontinued.

As the morphine is reduced, abstinence or withdrawal symptoms begin to appear. It often will not be necessary at first to confine the patient to his bed, but as discontinuance proceeds, it will be necessary to do so and he may even require restraints before the task is completed. Abstinence symptoms occurring with this process vary in degree with the individual case. They are briefly: restlessness, irritability, pain, nausea, and occasional vomiting, and in some instances signs of circulatory embarrassment, but almost never signs of threatened collapse. As the restlessness, irritability and pain appear and increase in intensity, sedatives are administered in the form of bromide, sulphonal, trional and luminal, including sodium luminal by hypodermic. Analgesics other than opium and its derivatives, and occasionally combined analgesic sedative preparations such as allonal or cibalgine are also used. Free catharsis, but not drastic purgation, is secured. Ice and ice cold drinks help relieve the nausea and vomiting. In case of cardiac embarrassment the usual supportive treatment is used and if collapse be feared morphine is given by hypodermic at once. By the use of these therapeutic agents, the patient is kept quiet and relatively comfortable.

As reduction proceeds, the 10:00 a. m. and 2:00 p. m. morphine injections may soon be replaced by sterile normal saline, or opportunity is here presented to give part of the necessary sedation by hypodermic in the form of sodium luminal. After several days none of the injections will contain morphine, the last to be substituted by placebo, or sodium luminal being the bedtime injection. At the time of withdrawal of the last morphine, a large amount of sedatives will be found necessary. It is to be noted that many times the final withdrawal precipitates a psychosis of the Korsakow's type, in which the patient, although confined to his bed, makes journeys from the hospital, oftentimes long complicated trips, especially at night, is disoriented and is often quite noisy. At this time it may be necessary to place the patient in the mental department of the hospital or to secure a private nurse for a short time. This mental condition always clears up entirely and usually is of only a few days to a week in duration, although it occasionally persists for a longer time. Some writers have attributed this psychosis to the sedatives used rather than to the withdrawal of the drug, but, in our opinion, it is due to the latter.

This is the general plan but it is not to be thought that this must be adhered to rigidly. At times, on any given day, it may be possible to substitute a placebo for a regular morphine hypodermic, or again it may be necessary to increase the strength of a previously scheduled injection; or in event of threatened collapse which almost never occurs with this method an additional injection of the drug may have to be given. The schedule may usually be picked up again in the last mentioned case, but occasionally the total amount may have to be increased and reduction continued again on a new schedule. It is best to make the schedule day by day in accordance with the condition of the patient. The advantages of the method outlined are: certainty of success as to discontinuance of the drug, as isolation of the patient precludes access to morphine; freedom from danger, as it is extremely seldom that collapse threatens the patient's life; and shorter duration of the abstinence symptoms, leaving a longer period for convalescence.

The withdrawal or discontinuance of the drug having been accomplished, the less difficult part of the treatment has been finished, for the convalescent period in the hospital and the care after discharge are most difficult to carry to a successful outcome. As to the convalescence in the hospital the following may be said. Mere withdrawal of the drug means nothing. It is necessary that a proper physical and mental condition be reached by the patient during his stay in the hospital if lasting results are to be obtained. How long a period this will require one cannot state beforehand, but as an average time one might suggest twelve to sixteen weeks. While it is true that at the end of six or eight weeks, the physical condition is satisfactory, the body weight is at a peak and normal sleep as a rule has returned, psychically the patient is not able to withstand all the influences of life outside the hospital without recourse to morphine. For example, he is not, at this time, ready to do regular mental work requiring concentration, for he lacks both power to concentrate and endurance. Gradually, ability to apply himself and to do mental work returns.

During the convalescent period the normal activities which have been discarded while the individual has been using the drug must now be resumed gradually. Regulated exercise, occupational therapy, and supervised social activities are introduced. Psychotherapy, through appeal to all the normal inclinations, for the purpose of barring the road to an eventual return of the demand for the drug, is brought to play. Reasonable regard for the preservation of his health is of considerable value, but this alone will not suffice for he knows that morphine allays bodily discomfort. Awakening of normal emotional response to family and society, as well as rebirth of a personal honor and desire to be a useful human being are of much greater value. Finally the patient must be led to develop real faith and confidence in himself.

Normal physical strength and endurance having returned, natural sleep having again appeared, power of concentration and reserve energy for mental activity being present, normal social activities having been resumed, and all physical and psychical desire for the drug having disappeared, the patient is discharged from the hospital. As previously stated, one cannot judge beforehand how long this convalescent period will last, for each case is a problem in itself.

The prognosis in chronic morphine intoxication is at best not very favorable, relapses occurring in a large percentage of cases. Proper care after discharge from the hospital is the greatest help in preventing a relapse, but unfortunately the doctor comparatively seldom has the opportunity to carry out this much needed part of the treatment.

The physician should remain in contact with the patient and the complete confidence already established in the medical adviser must be maintained at all times. After several months of close supervision, regular work is gradually resumed by the patient. The old environment must be avoided where this leads to contact with the drug, namely, in all those cases in which the drug had not been secured through truly legitimate channels. The doctor must concentrate on the development of the patient's personality and individuality, having him continue the normal activities instituted during the convalescent period in the hospital. If possible the patient should develop and follow a hobby; if a person engaged in a manual occupation, preferably some activity requiring mental effort chiefly; if one engaged in a profession or occupation the essential requirement of which is mental effort, a hobby the basis of which is physical activity, such as golf, cabinet work, or the like, should be encouraged. The individual should avoid being alone and overexcitement and overwork must be excluded.

Above all, should the patient become irritable, depressed or fatigued, he should at once report to his physician. Finally there must be a constant willingness on the part of the physician to aid the patient at times of weakness or depression, for then is when relapse is especially threatened.

1068 LOWRY MEDICAL ARTS BUILDING

THE PRESENT STATUS OF INDICATIONS FOR RENAL SYMPATHECTOMY*

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RENAL sympathectomy is becoming increasingly more widely practiced and involves many interesting physiological and anatomical problems which have just begun to be investigated. Renal sympathectomy has been advocated in the following conditions:

1. Renal sympatheticotonus.
2. Painful nephroptosis.
3. Nephralgia or renalgia.
4. As a complementary procedure in pelviolithotomy or nephrolithotomy as a prophylactic measure against recurrent stone formation.
5. Certain types of nephritis in which medical management is not satisfactory in controling the advance of the disease.
6. Reflex anuria.
7. In the remaining kidney in patients on whom a nephrectomy for tuberculosis has been performed.
8. In cases of severe hypertension.

With all of these indications, one can readily see what a large problem this subject presents.

The nerve supply to the kidney reaches it through the renal plexus which derives its fibers from the splanchnic nerves and the vagi. This plexus surrounds the vessels of the renal pedicle in a plexus-like network and is distributed to the pelvis of the kidney, the vascular network, and the secretory portion of the parenchyma as well as the upper third of the ureter. The effect of the splanchnics on the secretory mechanism of the kidney is supposed to be mainly operative through its vasomotor control. This function of vasomotor control can act so completely that absolute anuria may be the result. When the splanchnic control is interfered with, vasodilation occurs and a definite increase in the excretory function of the kidney results. This last statement has been experimentally demonstrated by a large number of investigators dating back as far as the work of Claude Bernard in 1854. Following sympathectomy, the total amount of urine excreted by a kidney is increased about 25 per cent, with a relative decrease in concentration but an increase in the total amount of solids excreted.

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The action of the sympathetics on the motility of the renal pelvis has been very inadequately described and recognized. The action on the motility is that of a tone-control and pace-maker. The sympathetics also contain the pain-conducting fibers from the kidney. The action of the vagus is so incompletely understood that it will not be discussed.

In order to satisfactorily study the function of the musculature of the pelvis of the kidney and ureter, the best means of investigation is pyeloscopy. By pyeloscopy we mean the fluoroscopic observation of the activity of the renal pelvis and ureter following the retrograde injection of a radio-opaque medium into the pelvis. This method was first introduced by Manges as early as 1912, at which time he was using it to insure satisfactory filling of the upper urinary tract before pyeloureterograms were done. Since 1924, when Legueu and his co-workers began using it for observations on the motility of the upper urinary tract, several very valuable contributions have been made on the actual mechanism of the musculature of this tract.

I have been using this method a little over two and a half years and feel that from a diagnostic standpoint it is just as important in examinations of the urinary tract as fluoroscopy in the gastrointestinal tract.

The observation of the effect of drugs on the motility has been carried out by Jona and Flecker, who found by direct fluoroscopic observation that atropin definitely retarded the activity of the pelvis and ureter and produced dilation of the pelvis to such an extent that pain was produced by over-distention, which in turn was relieved by the administration of eserine. They found that morphin, eserine, pituitrin, ergot and strychnin definitely stimulated the motility of the upper urinary tract.

The normal mechanism, as I have considered it to be after numerous observations, takes place as follows: First, the upper calyx of the renal pelvis contracts, expelling a portion of its contents into the funnel or collecting portion of the pelvis. This in turn is followed by contraction of the second and third calyx, depending upon whether it is a bifid or trifid type of pelvis. The funnel portion of the pelvis enlarges to receive these successive charges and then the ureteropelvic junction, which has competently retained the pelvic contents, begins to relax and the funnel itself contracts and expels a portion of its contents down the ureter in the form of a streak. This streak normally is not over one-third of the length of the ureter and is rather uniform in width except for a conical tapering at both ends. This streak moves down the ureter and passes into the bladder, leaving the ureter entirely free of any urine content. In the meantime the calices and pelvis have relaxed in a state of diastole or rest as the calices become filled with newly secreted urine.

The mechanism just described is then repeated. Normally this mechanism can occur coördinately and regularly even though the upper urinary tract is completely severed from all central nervous system connection, indicating that the mechanism of the upper urinary tract is self-contained and self-sufficient for normal functioning.

Harris and Harris, of Australia, were the first observers to describe definite abnormal syndromes which were pain-producing and capable of being relieved by eserine and renal sympathectomy. They called this abnormal group of symptoms "renal sympathetico-tonus" and report 28 cases relieved by renal sympathectomy. This syndrome is characterized by demonstrable spasm in one or several calices or at the ureteropelvic junction with or without dilation, the reproduction of the type of pain complained of by distention of the pelvis of the kidney, and the relief of this pain by eserine, and, in some cases, accompanying evidence of increased sympathetic irritability in other portions of the body.

In addition to the syndrome of renal sympatheticotonus just described, there are many other variations of hypermotility and hypomotility which I have observed. The effect of the position of a person with ptosis of the kidney on the motility of the urinary tract is also very variable.

Renal sympathectomy for renal sympatheticotonus is, according to Harris and Harris, the proper treatment. I have found, however, in several cases of renal sympatheticotonus that the patient, when relieved by eserine, will not submit to surgery because of the satisfaction experienced in taking eserine.

I have had one patient whose syndrome was entirely different from that described by Harris and Harris in that there was no spasm in any portion of the urinary tract but an extreme hyper-activity of the entire urinary tract so marked that satisfactory pyelograms could not be obtained by the ordinary method of injection. Pyeloscopy demonstrated the upper urinary tract to be normal in contour but extremely overactive. The pain of which the patient complained was also reproduced by distention of the pelvis under fluoroscopic control. Eserine and atropin were both used in this case without any results and he submitted to renal sympathectomy because of my inability to relieve him by any other measures. Three months post-operative he is free from pain. Why this patient has been relieved of pain is speculative because we do not know whether the motility of the urinary tract has been changed or whether the severance of the pain-conducting fibers has produced the result. This can only be determined by follow-up pyeloscopy and the further observation of the patient.

Painful nephroptosis is another controversial subject. There are equally eminent physicians for and against nephropexy for painful nephroptosis. I believe that a better understanding of this problem can be had through the use of pyeloscopy before determining the method of procedure. Every patient with painful nephroptosis that I have observed by pyeloscopy has a different fluoroscopic picture. All have definite retardation in emptying either in the prone or upright position.

Without going into all of the phases of nephroptosis, I wish to say that I believe those who have been most successful in relieving painful nephroptosis by nephropexy have done so because they have either intentionally or unwittingly interfered with the renal plexus during their mobilization before a nephropexy. To support this opinion, I wish to offer the following evidence:

1. Dr. Elmer Hess, of Erie, Pa., has treated a number of cases of painful nephroptosis by renal sympathectomy and allowed the kidney to assume whatever position it would without doing any form of nephropexy. His results seem to have been as satisfactory as any others.

2. The Mayo Clinic technic for doing nephropexy does not even visualize the renal pedicle so that the chance of interfering with the renal plexus is practically nil. Their attitude toward nephropexy has been extremely conservative because of poor results in their own hands and because of their opportunity to see the poor results of nephropexy in the hands of others whose patients consult them because of failure to obtain relief. The technic employed by those most enthusiastic about their satisfactory results in nephropexy consists of a very thorough mobilization of the renal pelvis, pedicle and upper ureter so that they must interfere to some extent with the renal plexus.

3. Mr. Frank Kidd, who has had a wide experience in nephropexy for painful nephroptosis, emphasizes the intentional stripping of the renal pedicle in order to accomplish sympathectomy as a step in his nephropexy technic.

4. Major J. C. Kimbrough, Medical Corps, U. S. A., has done nearly 200 nephropexies in which he has also done sympathectomy as a step in his surgical technic, with very satisfactory results.

I am sure that the sympathetics and abnormal motility do not explain the pain in all cases of painful nephroptosis, but I feel quite sure that renal sympathectomy makes nephropexy for painful nephroptosis more satisfactory.

Renal sympathectomy for nephralgia and renalgia has been reported by a number of writers with satisfactory results.

Sympathectomy as a complementary procedure in pelviolithotomy or nephrolithotomy as a prophylactic measure against recurrent stone formation has been advocated on the basis of producing a less concentrated urine and therefore less likelihood of further calculus formation. I can see no contraindication to doing a sympathectomy in renal stone cases where exposure of the renal pedicle is easily accomplished. In certain cases, however, the exposure of the renal pelvis will be technically so time-consuming and so difficult that it should not be done because of a resultant increased surgical risk. This is especially true in cases which have had a previous renal operation.

The indication for renal sympathectomy in certain types of nephritis in which medical management is not satisfactory in controlling the advance of the disease is just beginning to be studied. There have been several case reports of patients who have been definitely benefited by sympathectomy who were not getting along satisfactorily with treatment in early glomerulonephritis. The explanation for the improvement in these cases, of course, is that the blood flow through the glomeruli is increased through the vasodilator effect of sympathectomy.

Renal sympathectomy has been suggested in cases of reflex anuria and theoretically it seems to be a much more reasonable procedure than decapsulation. Neuwirt has reported a case of reflex anuria which was relieved by injection of the splanchnic nerves by the method of Kappis.

Renal sympathectomy in the remaining kidney, in patients on whom a nephrectomy for tuberculosis has been performed, has been advocated in order to produce a better blood supply to the kidney upon which the patient has to rely for his existence. This indication I do not believe is reasonable, but some surgeon may carry it out.

Renal sympathectomy has also been advocated in cases of severe hypertension, on the theory that increasing the bed of the circulatory system in the kidney by sympathectomy would result in an appreciable and satisfactory reduction in blood pressure. This is also a rather theoretical indication and it will remain to be seen what results are obtained in the hands of those who try it.

SUMMARY

Painful abnormal motility syndromes of the upper urinary tract may be recognized by pyeloscopy and relieved by eserine or by sympathectomy.

Renal sympathectomy is a valuable technical step in nephropexy to insure the best results in pain relief following kidney fixation.

Renal sympathectomy is indicated in (1) nephralgia, (2) as a prophylactic against recurrent renal stones when technically easy, (3) in reflex anuria as a last resort.

The indication for renal sympathectomy in cases of glomerulonephritis is being investigated now and further reports will more satisfactorily evaluate its use.

Recent information on the physiology and pharmacology of the upper urinary tract serves to but open a field rich in possibilities of a far better understanding and treatment of painful conditions of this portion of the body.

DEMOCEDES*

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According to popular tradition the most famed of the ancient Greek physicians was Hippocrates. The belief has arisen also that Hippocrates was the first and probably the only great physician of ancient Greece. It is for this reason that I wish to direct attention to the life and adventures of Democedes, who lived approximately seventy-five years before Hippocrates and in his day probably assumed the high position later accorded to Hippocrates. The reason why Democedes has been largely over looked by modern authors is that the only surviving record of his life is found in the third book of Herodotus, a lay historian. Scattered allusions are to be found in some of the fragmentary verses of Anacreon, in the writings of Lysis, and in some of the Persian tablets preserved from the reign of Darius the Great of Persia. Democedes was famed not only on account of his skill as a physician, but on account of his association with numerous truly great makers of history of the sixth century before Christ. He it was who was the first deliberately to suggest to Darius the unwarranted attempted invasions of Greece by Persia, which almost changed the course of the civilization of the world and which caused a tremendous loss of both lives and property in Greece.

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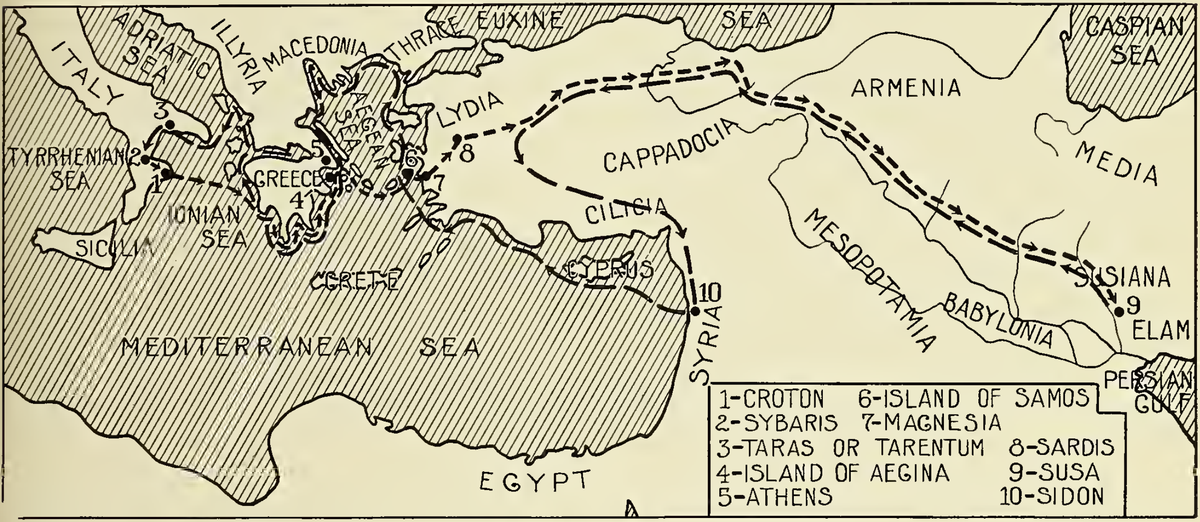
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1-CROTON 6-ISLAND OF SAMOS
2-SYBARIS 7-MAGNESIA
3-TARAS OR TARENTUM 8-SARDIS
4-ISLAND OF AEGINA 9-SUSA
5-ATHENS 10-SIDON

Fig. 1. Map showing the wanderings of Democedes.

Democedes was born in Croton about 550 B. C. The city of Croton had been founded about 710 B. C. by a band of wandering Achæans, under the leadership of Myscellus, who had been driven from their homes on the northern coast of Peloponnesus by invading Dorians. Legend states that Croton had its origin when Herakles, a local prince, who afforded hospitality to Hercules, was accidentally killed by him and buried at that site. Croton, together with a neighboring but smaller city, Sybaris, forty miles to the north, formed the two most important cities of Magna Græcia. The harbor of Croton was only fair, but it afforded the only safe anchorage between the cities of Reggio, near the site of the modern Messina, to the south, and Taras, situated on the northern shore of the modern Tarentine gulf, to the north. The domain ruled over by Croton extended to the west coast of Italy. Its most famous colony was Paestum, which today is celebrated for the superb ruins of the temple dedicated to Poseidon, whose grandeur rules the surrounding waste. Croton, at the time of Democedes' birth, was not only an important commercial center, but was probably one of the most important centers of art and learning to be found in Greece. The temple of Æsculapius, situated here, was stated by Herodotus to have been the best in all Greece at that time. Here fresh air, pure water, rest or exercise, as might be needed, diet, massage, heliotherapy, hydrotherapy, and athleticism played a major part in the treatment of the sick who came to the temple for care. The innumerable votive tablets left by grateful patients recorded the salient facts of each case, and, as a consequence, soon became valuable sources of medical instruction.

The accession of Peisistratus at Athens marked the onset of a fifty year period of unrivaled prosperity for Croton and Sybaris, which continued until the disastrous civil war of 510 B. C., resulting in the complete destruction of Sybaris by Croton. The wealth and luxury of these two cities of Magna Græcia formed a marked contrast with the poverty and simplicity of Greece proper. The power, magnificence, and influence of these cities were astounding; the legend of grandeur has come down through the misty pages of history as rivalling that of King Midas. The population of Croton in 550 B. C. has been estimated to have been more than 700,000, and its surrounding walls were fourteen miles in circumference. After 588 B. C., Croton obtained its first world-wide fame on account of the successes of its athletes in the Olympic games. The most famous of its victors was Milon, the wrestler, who was said to have been the strongest man concerning whom there are any written data. Moralists of that age pointed to Croton and Sybaris as extremes of excessive luxury and oriental extravagance. From 530 B. C., Pythagoras and his pupils referred particularly to Sybaris as the object of effeteness.

Democedes was the son of Calliphon, the priest of the temple of Æsculapius at Croton. Calliphon was a member of the hereditary Askelpiad, the physician-priests of Greece. According to Jayne, Calliphon had been educated and had served an apprenticeship at the temple of Æsculapius at Knidos. Thus, Democedes could trace his ancestry back to Æsculapius, the Greek god of medicine. Calliphon was apparently the chief priest at Croton and a man of great importance in civic affairs.

As the settlers of Magna Græcia kept in very close touch with Achaia, and did not differ from them in tradition, religion, or language, it may well be believed that Croton, its most important city, was at that time as well versed in arts and sciences as Athens itself. Democedes was educated at the temple of Æsculapius in Croton. The name of Democedes came to be perpetuated as the result of a historical exigency, rather than as the result of his marked professional achievements. He was not a great teacher, but it was as the direct result of his practice of medicine that he occupied the stage when the great Greek historian of the fifth century before Christ, Herodotus, raised the curtain on the portrayal of the first act of that tremendous drama of the attempted Persian invasions of Greece. I shall attempt to record the exact manner by which Democedes initiated that stupendous movement of the East on the West.

Democedes, at the age of twenty years, had completed his education. Shortly after the conclusion of his courses in astronomy, mathematics, music, physiology and medicine, he had a violent quarrel with his father. Herodotus, according to Godley, stated, "He was troubled with a harsh tempered father at Croton, whom, being unable to bear, he left . . ." Democedes left Croton in 530 B. C. and became a wandering Greek physician, who had neither money nor equipment with which to practice his profession. He arrived at the Island of Ægina about 529 B. C. and Herodotus says, "Settled there, before a year was out, he excelled all the other physicians, although he had no equipment nor any of the implements of his calling." The success of Democedes was so great that at the end of his first year he was elected by popular vote in public assembly to be state physician for the ensuing year at a salary of 1 Attic talent. The value of this was, according to Meara, $1,900 in our money and undoubtedly represented a much larger sum in its purchasing power. Osler has explained that state physicians were men of great repute, whose ability was unquestioned and who were the most skillful physicians in a given locality. He also stated that it was the custom of the state physician, at the close of a year's service, to appear before a court of review, at which time any charges of malpractice occurring during the preceding year could be heard and judgment rendered. The success of Democedes as state physician at Ægina was so phenomenal that he was engaged by the city of Athens in 527 B. C. to be its state physician at a salary of approximately $2,100. He arrived in Athens at the close of the rule of Peisistratis, the greatest absolute ruler that Athens was to know. Under his benevolent rule Athens enjoyed a period of unprecedented peace during which the arts and sciences flourished. Under the patronage of this autocrat, the Panathenaic festival was founded, complete copies of Homer's poems were collected, the reforms of Solon were put into effect, and many of the huge temples of the Acropolis were started, the most famous of which was the beginning of the temple to Zeus Olympus. In reality, Democedes arrived in Athens during its golden age. A profound impression must have been made on Democedes by Peisistratis' bid for power, his ability to return to Athens after being banished, and again gain control of the government, his physical and mental grace, the nimbleness of his wit and his resourcefulness, together with his guile.

Democedes remained in Athens only one year.

Records from that period indicate that his success as a state physician was tremendous and that it was he who first placed the office of state physician on a plane of respectability. He was a friend of Peisistratis and his two sons, Hippias and Hipparchus. At the close of his year in Athens, he was engaged by the most powerful Greek of that time, namely, the tyrant of the Island of Samos, Polycrates. His salary was said to have been 2 talents, or approximately $2,400. According to Dunglison, Democedes now ceased being a wandering Greek physician and became permanently attached to the court of Polycrates. It is Libby's belief that Democedes was probably the first Greek physician of whose life we possess any account.

Democedes spent the next four years, from 526 to 522 B. C., very happily. Although Polycrates was the cruelest of all the Greek tyrants, nevertheless, he was a great patron of the arts, and collected about him a representative group of the philosophers and poets of that time. In a short period, he had become the absolute master and leader of the Grecian states. As Herodotus states, "He . . . was the first Greek of whom I have knowledge, to aim at the mastery of the sea. . . . Of such as may be called men, Polycrates was the first to do so. . . ." His sea power was so widespread at that time that he controlled the Ægean sea, defied the combined forces of Corinth and Sparta, made separate treaties with Egypt, and forced Cambyses, ruler of Persia, to recognize him as a power to be respected. He was superbly wicked, a freebooter, an adventurer, a murderer, and a fratricide. Here at Samos resided the great lyric poet, Anacreon, designated by the Alexandrian critics as one of the nine greatest lyric poets. A fragment of poetry attributed to Anacreon is in existence in which he, in a spirit of jest, addressed Democedes, and told him that he would rather trust to the medicinal value of his favorite wine than to some of the remedies Democedes used. It is stated that Democedes and Anacreon became the companions and confidants of Polycrates.

The successes of Polycrates and the tremendous wealth of his court were instrumental in bringing about his downfall. Oroetes, the Persian governor of the province of Lydia, having been chided by Mitrobates, the governor of Dascyleium, over the fact that Oroetes had not seized Samos for his own, and because of the fact that one of the heralds of Oroetes had been supposedly insulted by Polycrates in his court at Samos, he decided to lure Polycrates to the mainland and there murder him. Oroetes invited an envoy of Polycrates to visit him in Lydia for the purpose of arranging an alliance between them, by which Polycrates was to offer safe conduct to Oroetes and his great wealth from Lydia to some point of safety outside of Persia. In return for these services, Polycrates was to be given a huge sum of money. Polycrates needed money badly in order to maintain his large fleets on the Ægean sea. Oroetes filled eight chests almost full of stones and then covered them with a thin layer of gold and jewels, giving the appearance of huge chests full of precious stones and metal. These chests were then sealed and the seals were broken and displayed to the envoy of Polycrates on his arrival in Lydia. The envoy returned to Samos and reported the supposed great wealth which he had seen in the treasure-rooms of Oroetes' palace in the city of Sardis. Polycrates then decided to visit Oroetes personally to consummate their alliance. The diviners and friends at the court of Polycrates endeavored to dissuade him from this adventure. His daughter dreamed that she saw her father aloft in the air, washed by Zeus, and anointed by the sun. When she told her father of this dream and prophesied that evil would befall him if he made this journey, he threatened her that if he came back safe she would long remain a virgin. And, as Herodotus stated ". . . She answered with a prayer that his threat might be fulfilled; for she would rather, she said, be long left a virgin than lose her father."

Polycrates sailed to the city of Magnesia on the mainland with a fifty oared ship. He had a great retinue of followers; Herodotus continued, "among whom was Democedes, son of Calliphon, a man of Crotona, and the most skillful physician of his time." When Polycrates arrived at Magnesia in 522 B. C., he was immediately seized by the soldiers of Oroetes and killed; as Herodotus summed up the situation, ". . . He was foully murdered, making an end which ill beseemed himself and his pride; for, saving only the despots of Syracuse, there is no despot of Greek race to be compared with Polycrates for magnificence." Following his death, he was crucified by Oroetes, and all of his retinue who were not natives of the island of Samos were enslaved by Oroetes and sent to dungeons in the city of Sardis, the capital of the Persian province of Lydia.

Following this, Cambyses, the Persian monarch, died, returning from his conquest of Egypt, and in the resultant confusion and revolt incident on the assumption of the Persian throne by the false Smerdis, Oroetes decided to become the sole ruler of what is modern Asia Minor. He murdered Mitrobates and his son, and committed other deeds of violence. He murdered a messenger of Darius and confiscated his jewelry and property. In addition to this, he supported the Medes in an unsuccessful attempt to revolt from Persia. As soon as Darius was able to stabilize and consolidate the Persian empire, he then directed his attention to the far-lying province of Lydia, and had Oroetes put to death by royal decree. This occurred about 520 B. C. The slaves and possessions of Oroetes were confiscated and moved from the city of Sardis over the Royal Persian road to the city of Susa, the capital of Persia at that time. During this entire period, Democedes had languished as a slave in the dungeons of Sardis, totally forgotten.

Shortly after Democedes' inconspicious arrival in Susa, with the other slaves of Oroetes, a most fortunate chain of circumstances occurred. Herodotus describes it as follows: "It happened that Darius, while hunting, twisted his foot in dismounting from his horse, so violently that the ball of the ankle joint was dislocated from its socket. Darius called in the first physicians of Egypt, whom he had till now kept near his person, who, by their forcible wrenching of the foot, did but make the hurt worse, and for seven days and nights the king could get no sleep for the pain. On the eighth day, he was in very evil case; then someone who had heard in Sardis of the skill of Democedes of Croton, told the king of him. Darius bade Democedes be brought to him without delay. Finding the physician somewhere all unregarded and forgotten among Oroetes' slaves, they brought him into view, dragging his chains and clad in rags."

Darius asked Democedes if he had a knowledge of medicine, which Democedes promptly denied because he feared that by revealing the truth concerning his ability he would be entirely cut off from Greece. However, Darius penetrated his subterfuge and under the threat of the use of scourges and goads, Democedes admitted that he had an inexact knowledge of medicine but that he had been associated with a physician, meaning Calliphon, and that in consequence his knowledge was not of value. However, Darius apparently recognized his ability and immediately placed himself under his care. Herodotus tells us that that night, under the ministrations of Democedes, Darius was able to sleep and that in a short time, with the use of gentle measures, the dislocation was reduced and Darius was restored to full health. Darius had despaired of ever being able to use his injured foot again. As a consequence of his cure and restoration to health, Darius' gratitude was unbounded, and magnificent and barbaric expressions of his regal gratitude and favor were made. Duplicates of his prison fetters were fabricated in gold and presented to Democedes, together with a great treasure. Democedes was given a house in Susa, with a large number of slaves, and was made a constant table companion of Darius. The only boon that was consistently refused Democedes was his freedom to return to his native Hellas. Through the successful intercessions of Democedes, the lives of the less fortunate Egyptian court physicians were spared and they were allowed to return in safety to Egypt. It is stated that Darius and Democedes became very close friends and that Democedes accompanied Darius on his various hunting expeditions and on state visits to various portions of the Persian empire. However, by the year 518 B. C. the novelty of this life began to pall and Democedes began to scheme how he could return to Greece. At this time, another fortunate circumstance occurred, which furthered his plans of escape. An abscess developed in the breast of Queen Atossa, which Democedes was able to heal completely after he had extracted from her a promise to perform a duty which he would request of her in the future. She, true to her bargain, having been coached by Democedes, persuaded Darius to invade Greece. She suggested, however, that before such a huge project was attempted, a band of Persian nobles, under the guidance of Democedes, be first sent to spy out Greece and determine what would be the most feasible route of invasion. Darius complied with her suggestion. The next morning, according to Cheney, he called before him a group of fifteen Persian nobles and gave them their instructions, warning them that under no circumstances was Democedes to be allowed to escape. Democedes was then called before Darius, and informed of his mission and was made to promise that he would not escape but would return to Persia as soon as the mission was completed. Darius offered to have all of Democedes' treasure, which he possessed in Susa, sent with him as presents to his brethren and to his father, in Greece. Democedes, however, fearing that this might be a trap by Darius, declined, and stated that he would rather leave his treasure and possessions in Susa and enjoy them on his return from Greece. Darius was pleased with this answer and instructed the commission to proceed to the city of Sidon on the coast of Phœnicia and there charter two triremes and a great galleon in which they were to carry gifts for Democedes' father and brethren. The commission surveyed all of Greece, until finally, near the conclusion of their efforts, they reached the city of Taras, in Italy. It is very probable that a complete survey was thoroughly conducted of the status of all the Greeks, including the Asiatic and insular branches. This Periplus, if it had been preserved, would have been of inestimable value historically, because it would have given a complete account of the actual state of the Grecian world about 518 B. C.

Democedes was able to persuade Aristophilides, king of Taras, to detain the Persians as spies, and to remove the rudders from their boats in the harbor. Democedes escaped to Croton, after which the Persians were freed and allowed to depart unmolested. The Persians sailed at once to Croton, where they endeavored to recapture Democedes in the marketplace. The citizens rallied to the aid of Democedes and dispersed the Persians. The galleon, which had originally been intended by Darius for the father and brethren of Democedes, was now confiscated by the wily Greek for his own use. The Persians were then placed on their two remaining triremes and ordered to sail for Persia. To continue their survey then would have been courting death and capture and loss of their survey of Greece and its possessions. Just prior to their sailing, Herodotus describes the final boastful act of Democedes: "They should tell Darius that Democedes was betrothed to the daughter of Milon. For Darius held the name of Milon, the wrestler, in great honor; and, to my thinking, the reason of Democedes seeking this match and paying a great sum for it, was to show Darius that he was a man of estimation in his own country as well as Persia." Here ends the written account of the life and adventures of Democedes, as described in the third book of Herodotus, paragraphs 125 to 138, inclusive.

The following may be drawn on supposition concerning the future conduct of Democedes in the city of Croton, from 518 B. C. onward. His father-in-law, Milon, is said to have been the greatest Greek wrestler of ancient Greece. His phenomenal strength was world-wide. For example, he carried a live full grown ox on his shoulders through the Olympic stadium. He was six times crowned victor at the Olympic games and seven times at the Pythian games for wrestling. He was a man of great importance in the civic affairs of Croton and was the chief disciple of Pythagoras. It was he, as commander of the Croton army, in 510 B. C., who completely razed the city of Sybaris and turned the bed of a river through its ruins to complete its destruction. So complete was the destruction of Sybaris that nothing today remains of that once important city. Soon after this, Milon, seeing a tree partly split in two by a wedge, attempted to complete the splitting of the trunk and thereby dislodged the woodcutters' wedge, whereupon his hand was caught in the tree trunk and he was unable to free himself. That night he was devoured by wolves.

It may be assumed that Democedes, like Milon, was a disciple of Pythagoras. Pythagoras arrived in Croton in 530 B. C. He held a unique position among the Greek philosophers in that he was a remarkable combination of the religious mystic and the man of science. The cult he founded, with its subsequent modification, endured for a thousand years. Tradition and myth have so covered the actual figure of the man that it is now difficult to visualize him as he actually was when Democedes knew him. Considering his scientific side, he was the first of that great line of philosophers who made the sixth century before Christ a distinct period in the intellectual progress of the human race. Pythagoras was born on the Island of Samos in 580 B. C. He was a pupil of both Thales and Anaximander. He visited Egypt, Phœnicia, and Babylon on tours of investigation and instruction. According to Arisoxenus he carried the subject of arithmetic far beyond the needs of the commercial world of his day. The discovery of the Pons Asinorum was attributed to him, as was the substance of the first book of Euclid on geometry. He discovered the fourth and fifth intervals of the octave. Herakleitus, his severest critic, according to Meara, admitted that he was "a man of extensive research and acquired instruction." Pythagoras combined the character of a sophist with that of a great teacher, prophet and miracle worker.

His religious views were essentially as follows: He placed high value on ethical discipline, simplicity of food and attire, tabooed bloody sacrifices and animal foods, believed in kindliness, truthfulness, justice and fidelity toward all men. The appearance of Pythagoras at Croton produced an electric effect. On his first address, 2,000 persons were converted. Luxury was discredited, women wore their simplest attire, incontinence disappeared, and political discontent was frowned on. Pythagoras formed a select order of 300 influential citizens of Croton. This order was interested in science, politics and religion. Other similar clubs were formed quickly throughout Italy and Sicily and rapidly gained widespread poltical influence. Pythagoras was largely influential in causing the war between Croton and Sybarius. The very exclusiveness of the Pythagoras order shortly began to cause suspicion, envy, and open opposition. The opposition finally became organized and using open violence, according to Meara, wiped out the entire local order, in 450 B. C., when all the characters of our narrative were dead. The great importance and success of Pythagoreanism was largely due to the fact that it appealed to all sane thinking Greeks, who abhorred the revolting worship of the Greek god Dionysius, who had his chief center of worship in Croton. The importance of Pythagoreanism will be apparent when it is recalled that it remained when fused with Neoplatonism as the only chief rival of Christianity up to the year 500 A. D.

According to Power and Sarten, a great contemporary of Democedes made his appearance in Croton about 500 B. C. He was Alcmæon. His book on medicine is today only indicated by a few fragmentary passages, which, with works of Democedes, were lost with the destruction of the great library at Alexandria. He was the first to make recorded dissections on animals. He discovered the optic nerve, the trachea, and two types of veins, one empty and one carrying blood. He offered a sound physiologic explanation of sleep, sense impressions, and fatigue. The brain was recognized by him as being the central organ of intellectual activity. If fatigue and malnutrition gained the ascendency in one's life, disease resulted, but if they did not, health was the invariable result. Alcmæon is reputed to have been the first Greek physician to contribute actual scientific accomplishments to the field of medicine. The lives of Milon, Pythagoras and Alcmæon give a slight insight into the contemporaries of Democedes and how their deeds and thoughts influenced his later life.

Democedes, even seventy-five years after his death, was still considered throughout Greece to have been the most skillful and famed of all Greek physicians of that period. Herodotus classed him as the equal to the then living Hippocrates. The knowledge, memory, and so forth, of Democedes has been preserved for us by Herodotus as a literary exigency about which his epic of the Persian invasions of Greece revolved. It must be remembered that it was Democedes who first suggested to Darius the unwarranted invasion of Greece, solely as a means for personal escape to his home in Magna Græcia. It is hard to excuse his type of selfishness which placed in potential peril the freedom of an entire race and nearly changed the course of human development throughout the world. Democedes is of further interest in that he possessed the unusual quality of character by which he became the close friend and confidant of many of the outstanding characters of the sixth century before Christ, namely, Peisistratus, Polycrates, Anacreon, Darius, Atossa, Milon, Pythagoras and Alcmæon. He was an excellent example of those Grecian characteristics made famous by Homer, and must be judged by Homeric ethics rather than by those of the present day.

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LEUKORRHEA—TWO COMMON CAUSES

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THE two most common causes of leukorrhea are endocervicitis and vaginitis due to the trichomonas vaginalis. Because leukorrhea is a striking feature of each of these two pathological conditions, its origin may be ascribed to one or the other too hastily, and so, perhaps, wrongly. Of the 78 cases of trichomonad infection reported by Kleegman[1], 50 per cent had been previously seen by other physicians. "Of these, six had been told they had gonorrhea, six had had various operations advised, two had operations done, and one patient had one vaginal and two abdominal operations. Two had been told they had carcinoma of the cervix, which we proved to be eccentric erosions due to the trichomonad." Thus, of this 50 per cent, at least half have been wrongly diagnosed. Furthermore, the usual treatments for endocervicitis are not only valueless, but are often an aggravation, when applied to trichomonad infection.

The appearance of the vagina differs radically in the two conditions, except in patients where pregnancy and cervical inflammation coexist; here the congestion of pregnancy may cause the vaginal mucosa to resemble somewhat the appearance of a vaginitis. Where the cervix is the source of the discharge the vagina is often but little affected and its mucous surface may be pink and smooth. In trichomonad infection the surface is deeply injected and roughened—the "strawberry vagina." The cervical portion is likewise affected.

The discharge from an endocervicitis is heavy, thick, and tenacious—colored if pus is present. The trichomonad produces a discharge less tenacious and less homogeneous; it often has a foamy appearance—as though it had been whipped up by an egg beater. While it can readily be wiped off, the process is painful, and the mucosa may bleed; the discharge from an inflamed cervix is more difficult to remove because of its tenacity, but to do so rarely causes discomfort, and bleeding occurs, if at all, only from the eroded cervix.

Subjectively the two processes differ quite definitely; the vaginitis resulting from trichomonad infection is painful, causes severe dyspareunia, and an itching and burning often sufficient to produce insomnia. In endocervicitis the discharge annoys by its presence chiefly, and its most prominent subjective signs are frequently not local but general, and as such reveal themselves in the fatigue and irritability of chronic focal infection.

Bimanual examination in the presence of a trichomonad infection will show but little besides the extreme vaginal sensitiveness; in endocervicitis some phase of pelvic inflammatory tenderness, infiltration, or distortion is often found.

Both conditions are aggravated by the menstrual process, though the effect is usually more marked, objectively and subjectively, in the trichomonad infection.

The distinction between the two conditions is made certain in the examination of a smear from the discharge in which the presence of trichomonads is suspected. Some of the discharge on the gloved finger is touched on the slide, a drop of normal saline added and the preparation examined under high power. The organisms, from 15 to 20 microns long and 10 to 15 microns in width, can readily be seen in large numbers. They are extremely motile and their agitations on encountering a group of pus cells or a patch of epithelium are a fascinating and amusing spectacle.

The trichomonas are a variety of parasitic protozoa[2] with the discovery of which in 1837 Donne established the genus trichomonas to include this flagellate and gave it the specific name vaginalis. It is regarded as distinct from the varieties hominis (intestinal), and buccalis (mouth). While its form varies, typically it is pear shaped, somewhat rounded anteriorly and pointed posteriorly. An undulating membrane extends spirally across the body and four flagella arise from its anterior end. It is found only in acid vaginal secretions. It was first cultivated in artificial media by Lynch in 1915 and 1922.[3] Reproduction is by binary longitudinal fission. Its distribution is world-wide. The mode of transmission is unknown. The incidence of infection is about 10 per cent.

In neither of the conditions is urethritis or cystitis a common finding, and rarely is the trichomona transferred to the male through intercourse. Kleegman refers to only one reported case of pyelitis and cystitis caused by it. She also reports a few cases of urethritis and prostatitis caused by it, in two of which the organism was present in the vaginas of the wives. Cornell questions whether the male is able to harbor the trichomonas long enough to transmit infection since it needs so much moisture for its growth.[4] He reports a case of acute urethritis in the husband of a patient with trichomonas vaginalis. Although the organism is fairly common in the urine of women with this type of leukorrhea, it is rare that cystitis develops; should it do so, however, Cornell finds that a 10 per cent argyrol solution instilled into the bladder gives relief. These points, together with the microscopic examination of the smear, serve to differentiate this type of vaginitis from that due to the gonococcus. Kleegman notes that in the smear preparation from a vaginitis due to either organism there are many pus cells with few other bacteria; she believes that this similarity is responsible for the diagnosis of "elusive" gonorrhea even though that organism is not found. Here the simple saline preparation will easily show the trichomonad. Kleegman states, however, that "occasionally both infections may be present."

Cornell believes "that many cases of vaginitis in children are due to the trichomonas, although he has not been able to prove it scientifically because of the lack of material. The fact that trichomonas is diagnosed as gonorrhea in the adult so frequently leads us to this conclusion." Stein and Cope, although they searched for flagellates in children under treatment for vaginitis, found none.[5]

The treatment of the two conditions differs greatly. In endocervicitis, treatment is directed at a deep-seated infection within the cervical glands, and demands, therefore, powerful and penetrating agents, either thermal or chemical; hence the efficacy of silver nitrate and the cautery for this condition. For the trichomonas infection such drastic methods are not only unnecessary because the disease is superficial, but pernicious, because the tissues involved will not endure traumatizing measures.

Many methods of treating trichomonad vaginitis have been used; Cornell reviews a number of them. The method of Kleegman has been the most successful so far devised, and the speed with which patients experience subjective relief by this procedure is as gratifying to the physician as it is to the patient. The method is as follows: The vagina, with its walls stretched by the widely opened speculum, is carefully cleaned with tincture of green soap. In acute cases the smarting may be quickly relieved by applying cold water. When well cleaned, the vagina is carefully dried; during both cleaning and drying the speculum should be rotated so that all parts of the mucosa are reached. The drying should be completed by blowing air into the vault by means of a bulb.

The entire mucous surface is now painted with full strength pyroligneous acid.[6] This acid is a tar distillate sometimes called pyroligneous vinegar and consists of acetic acid diluted with more or less water and holding in solution some creosote and empyreumatic oil, with methyl alcohol. It is an antiseptic and a stimulant. Cornell uses 2 per cent mercurochrome, as does Kleegman during the acute stage. In none of my cases was the pyroligneous acid used. Next, several small wool tampons are inserted, well coated with

Lassar's paste (N.F.). Treatments are given three times weekly during the acute stage, and twice weekly thereafter. It is important that treatment be continued through the menstrual period, for the growth of the organisms seems stimulated by the presence of blood, and unless checked, their elimination becomes almost hopeless. Kleegman emphasizes the need of treating the vulvitis which is present. The same cleansing process is used about the vulva, and calamine lotion applied. The patient may carry out this process at home twice daily.

Under this treatment patients will experience great relief almost at once, remarking about it, at times, before leaving the office. Within two to three weeks, the patient will be quite free of symptoms. Treatment should be continued through at least two menstrual periods, however, for the disease has a tendency to return, and Cornell feels that even longer observation is required.

Recently, Goodall[7] has described a simpler method in which picric acid is used with such satisfactory results that he proclaims it a specific for trichomonas vaginalis infection. It is used in a vaginal cone of 1 per cent picric acid, inserted daily high in the vault on retiring. A plain water, soap solution, or mild lactic acid douche is used once daily.

He has treated twenty-two cases, four during pregnancy and three in the puerperium. His results were uniformly successful. The average course of treatment extended over five to ten days. The treatment is carried on during menstruation. This method, as Goodall himself says, has been used in but relatively few cases. Its simplicity, however, invites a trial.

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MONTGOMERY WARD & CO. UNDERTAKES URINE EXAMINING SERVICE

The A. M. A. Chemical Laboratory reports that in a recent catalogue, "Ward's 60th Anniversary—1872—Sixty Years of Progress—1932," appears an advertisement of a "new professional service." In bold face type appears: "Your urine should be analyzed at least every 90 days." It is inferred, of course, that this repeating service may be secured through Montgomery Ward & Co. The A. M. A. Chemical Laboratory requested five persons to send orders to Montgomery Ward & Co. accompanied by the required money order for $1.50. In due time there came from the firm an invoice addressed to each person with the statement that within a few days a container would be received with full instructions from "our laboratories." Shortly afterwards, each individual received through the mail a container and bottle which did not come from the Montgomery Ward & Co. home laboratories, but from the Universal Research Laboratories, Minneapolis, Minn. The American Medical Association has no information in its files concerning the Universal Research Laboratories in Minneapolis, nor have these laboratories been approved by the Council on Medical Education and Hospitals. Four specimens of urine, found pathologic by a competent investigator, and one specimen which was determined to be normal, were sent. In a few days came letters stating that the urinalysis report was enclosed; in each case the letter was almost the same except for the numbers indicated on the report. The letters were written on the stationery of the Universal Research Laboratories and bore the name of "H. W. Darby, M.D., Director." A typical letter contained the following: "Your urinalysis has been completed and we are enclosing your report herewith. In checking your report we note indications 5, 25 and 26 show a little faulty but you can correct these, if you follow directions set forth below the faulty indications, which are self explanatory. Your report is very encouraging, nevertheless it is a good idea for you to have these examinations from time to time to check yourself and protect your health." The reports did not indicate that a painstaking examination of the specimens had been made. For each of the pathologic specimens it was stated that the report was "very encouraging." In no case did the results reported agree with the character of the urine sent. (Jour. A. M. A., April 30, 1932, p. 1561.)

PRESIDENT'S LETTER

OUR annual meeting is over. The extensive, varied and interesting program was appreciated by the largest attendance in the history of the Association. The total registration was 1,724, of whom 1,030 were physicians. Affairs of this kind, that run smoothly, do not form themselves from thin air, but represent considerable planning, hard work, and effort on the part of certain interested members of the association.

It is the duty of the Committee on Scientific Assembly. composed of the chairmen and secretaries of the sections on medicine and surgery, the President, the Vice-President, and the Secretary of the Association, to arrange the program for the annual meeting. The President may add to that committee whomever he sees fit. It is increasingly difficult to arrange a program that will at least be the equal of that of the previous year. The personnel of the Committee on Scientific Assembly changes each year to a large extent, so that most of its members come fresh to the difficulties of assembling a program. Much of the credit for this last meeting is due to Dr. E. A. Meyerding and Dr. W. A. O'Brien, who have had wide experience in the presentation of medical subjects both to the profession and the laity. The problem of continuity in this committee therefore is an important one, and under the present arrangement unsatisfactory. It would be well if some arrangement were made whereby a program committee composed of five men qualified for such activities were appointed to act with the Committee on Scientific Assembly, one man to be dropped each year and a new appointee put on to serve for five years.

The difficulties the world is in now are said to be due to unsound economic and social conditions. Concerted and united action is essential to solve these problems. The Great War demonstrated what concerted action can do, although to our sorrow its goal was that of terrible and ruthless destruction of life and property. How thoroughly that goal was reached we all know. It will take the world a long time to recover and the scar will always remain. Social conscience must be awakened in all walks of life and the medical profession, as in the past, must and will render whole-hearted service. The evening of our program devoted to medical economics was well planned and conceived, taking up one phase of interest to us. Such discussions are best presented as this was, entirely apart and separate from the scientific program.

In periods of economic depression it becomes increasingly difficult to furnish to the mass of people all that medical science has to offer. Changes are taking place in the social fabric of all nations. Alterations are occurring in our methods of practice, and we cannot stay them; therefore, we must take a hand and guide these movements, moulding them into the best form for the good of the public and our own profession. Faulty as some of the forms of socialized medicine in European countries seem to us, nevertheless those practicing under such systems, complain though they may about the faults, are practically unanimous in saying the conditions are better than they were before. This alone is food for thought. The leading article in MINNESOTA MEDICINE for May by Dr. J. Gilfillan, entitled "Compulsory sickness insurance," should be read by every member of our Association.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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UNWARRANTED VETERAN EXPENDITURE

The attention of the taxpayer is being drawn by numerous articles appearing in the public press and various lay journals to the outrageous demands which have been successfully made on the government treasury by a relatively small group of war veterans. A few hundred thousand of the four million or more World War Veterans have been able to persuade our weak spined congressmen to extend and further extend grants of money and special privileges to former veterans so that they have become a privileged class. The raid on the treasury has gone to such an extent that 1,300,000 persons are now receiving bounty at the expense of the taxpayers, and as much as one-fourth of the federal government budget of four billion dollars is being handed over to about 1 per cent of the population.

This would not be open to criticism if this vast sum were being paid only to those who suffered physical or mental handicap in service to their country. Financial compensation to these unfortunates is none too much, and in cases of real disability is not begrudged by anyone. This sympathy, however, has been played upon by a small group of veterans to obtain special privileges for anyone who ever served his country in a war. This group that vaunts its former patriotism has made a fine display of themselves by their unpatriotic raid on the treasury.

It should be remembered that there are over three million former World War Veterans who do not belong to the Legion. It would be well for them to organize for the patriotic duty of saving the country from financial ruin in this time of peace. The Legion performance is a good example of what an organized minority can do.

The extension of free hospital service to veterans for disabilities unrelated to service put into effect in 1926 and the proposed expansion of the hospital building program to increase the available beds by 100,000 more or less, a subject which received such emphasis at the recent State Meeting, are only a part of this subject of the wanton expenditure of the taxpayer's money. That 82,850 patients were admitted to government hospitals in 1931 for disabilities having nothing to do with the War gives some idea of the favoritism being shown. With the proposed additional 100,000 beds this number must be multiplied several times and the private hospitals will be ruined, a larger number of physicians forced into governmental employ, and the Government Treasury—will it stand the strain?

When a man enters the Army by enlistment he does a patriotic duty; when by conscription he is forced to do what he should do. There is no law providing that he shall be paid by the government after he is mustered out. Yet more than twice the number of our dead and wounded are receiving monthly checks from the government. Pensions for disabilities sustained in civilian life because the sufferer is a veteran is another example of absurd discrimination. The doles handed out in monthly checks for supposed partial or total disability to veterans who are not appreciably disabled but are earning good incomes is another example of the extent to which the taxpayer's money is being squandered.

One of the results of the depression is the interest the taxpayer is taking in the expenditure of public funds. Public opinion is a very powerful weapon and the light being thrown upon the unwarranted expenditures on veterans is sure to result in at least some correction of what has been described as a lawful raid on the Treasury.

ANNUAL REGISTRATION OF PHYSICIANS

An analysis of the laws pertaining to the annual registration of physicians in the various states of the Union by Dr. E. J. Engberg, secretary of our State Board of Medical Examiners, appeared in a recent issue of the Federation Bulletin. There has been a steady increase in the number of states requiring annual registration of those engaged in the healing art since California led the way in 1917. Now seventeen states require this yearly registration with fees ranging from $1.00 to $10.00.

From the questionnaire sent to the secretaries of the various State Boards it was ascertained that the majority of the secretaries favor annual registration. Without it, a Board has a record only of those who have been licensed to practice in the state and data concerning the practitioner for the most part only up to the time he was licensed. With it, the Board knows who are practicing in the state. In addition, the registration fee furnishes a fund which can be used to enforce medical practice laws.

The practical result of such registration is well shown in the case of Minnesota. Previous to the enactment of the present law requiring yearly registration, prosecutions of those practicing in the state without a license were almost unknown, largely because of lack of funds. In the last four years, however, the Board has investigated 213 cases and obtained fifty-four convictions out of fifty-eight cases brought to court.

Some have objected to the principle of taxing the medical profession for the purpose of enforcing a law designated to protect the public. The same criticism might be made of other fees, which are in effect special taxes. On the other hand the enforcement of medical practice laws does benefit physicians as well as the public. Doubtless many State Medical Associations would be willing to donate a sum yearly, as is done in Kentucky, to help enforce these laws.

COST OF CULTS

Recently figures have been made available regarding the amount expended in this country on irregular practitioners of the art of healing. The data have been obtained by the Committee on the Costs of Medical Care. Approximately 125 million dollars is the figure paid to some 36,150 irregular practitioners. Of this, 42 million goes to some 7,650 osteopaths; 63 million to 16,000 chiropractors; 10 million to 2,500 naturopaths, and another 10 million to some 10,000 Christian Science and New Thought healers.

The rest of the report contains little that the average physician does not already know. The educational requirements for physicians have been steadily increased in recent years, but this has not resulted in protection for the public. The same basic educational requirements have not been required of the irregular practitioners and all go by the title of doctor. A short cut has therefore been provided to the title of doctor.

In recent years the undergraduate osteopathic training has been so extended and so improved that it seems not unlikely that eventually this group will be absorbed by the regular profession just as occurred in the case of the homeopath. We doubt whether the same will happen to the chiropractor, whose star seems to be distinctly on the wane.

The requirement of an examination in the Basic Sciences seems to furnish a state of ultimate protection from those ignorant of fundamental medical facts. Universal adoption of this requirement would help to solve the problem for the country as a whole and would help to correct the chaotic situation now existing throughout the country in respect to medical licensure.

DERMAL ABSORPTION OF SALICYLATES

Salicyl esters such as methyl salicylate (oil of wintergreen) are commonly prescribed as constituents of ointments, liniments and local applications, on the assumption that they possess a greater skin penetration owing to their lipoid solubility, than do other salicylates. The amount of salicyl absorbed under these conditions would appear nevertheless to be too small for definite systemic effects. The salicyl compounds offer a good opportunity for testing the comparative importance of lipoid and water solubility, and of the chemical reaction (basicity and acidity) in dermal absorption. A recent study indicates that lipoid solubility may not be as important as some other factors. Moderate degrees of chemical reaction (basicity and acidity), possessed by substances, appear to be more important than lipoid solubility for penetration of the skin. Alkalinity, which softens the skin, and acidity, which apparently hardens it, are more important than simple solution in the fatty secretion of the skin. (Jour. A. M. A., February 20, 1932, p. 643.)

OF GENERAL INTEREST

Dr. M. S. Henderson, president of the Minnesota State Medical Association, addressed the members of the Southwestern Minnesota Medical Society on "Fractures" at the semi-annual meeting held in Worthington, Minn., Tueusday, May 3, 1932. A film on "Traumatic Surgery of the Extremities" was also a feature of the program.

In order that a scale of charges more in keeping with the present general financial condition might be inaugurated, the board of managers of the Detroit Lakes Community Hospital recently reduced the rates in certain rooms in the institution. The rates for the operating room in some instances were also lowered.

Dr. Leo M. Crafts, Minneapolis, has recently received the formal invitation of the Neurological Society of Paris to attend the Annual International Neurological Reunion, at Paris in June; and to be a contributor to the program and the discussions of the meetings. This is an international gathering of neurologists, sponsored annually by the Paris Society, including mostly men from the adjoining European Countries and Great Britain, with a limited number especially selected from the United States. The meeting was omitted last year in deference to the convening of the International Neurological Congress, at Berne, Switzerland, in September, to which Dr. Crafts was named as a delegate.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MINNEAPOLIS QUACK PLEADS GUILTY AT HASTINGS, MINN.

State of Minnesota *vs.* John Hettwer.

John Hettwer, sixty-four years of age, residing at 3019 Hiawatha Avenue, Minneapolis, entered a plea of guilty to practicing medicine without a license at Hastings, Minnesota, on May 2, 1932, and was sentenced by the Honorable W. A. Schultz, Judge of the District Court, to a term of nine months in the Dakota County jail. In view of the fact that Hettwer has been in jail since April 20, 1932, the date of his arrest, and because of his age and his signing a statement that he would absolutely refrain from the practice of healing in any way, shape or manner in the future, Judge Schultz suspended the balance of his sentence and placed the defendant on probation. If any further complaint is made in reference to the defendant, he will have his suspension of sentence revoked and he will be placed in the county jail at Hastings. Judge Schultz severely admonished the defendant to get out of the medical business in view of his not being licensed nor qualified and to stay out of it or spend some time in the county jail.

Hettwer was arrested on the specific complaint that he had treated Mrs. James Danek, 447 Fifth Ave. S., South St. Paul, Minnesota, for goiter. Hettwer not only diagnosed her case but prescribed and furnished the medicine for treatment. Hettwer was born and raised in Germany, coming to this country in 1914. He admitted to the Court that he had practiced a little at Melrose, Minnesota, and also at St. Cloud, Minnesota. At the time of his arrest he was hostile and indignant, but at the end of two weeks in jail he cooled down sufficiently to thoroughly digest the warning given him by Judge Schultz. He was very meek in court and will undoubtedly be very careful about violating the Medical Laws in the future.

This is the first prosecution instituted by the Medical Board in Dakota County since the passage of the Basic Science Law and splendid coöperation was received from Harold Stassen, County Attorney. The warning given the defendant by Judge Schultz indicates that the Court intends to deal severely with quacks in that judicial district.

STATE BOARD OF MEDICAL EXAMINERS

Naturopathic "Physician" Pleads Guilty

State of Minn. vs. George Schuster

On May 9, 1932, George Schuster, fifty-four years of age, entered a plea of guilty to practicing healing without a Basic Science Certificate before the Honorable Lars O. Rue, Judge of the District Court, in Minneapolis, and was sentenced to pay a fine of $100.00. After being admonished by the Court to cease practicing healing at once and to refrain from it in the future, the defendant paid the fine. Judge Rue also informed counsel for the defendant that a second violation of the Medical Laws of this State would undoubtedly result in a trip to the Minneapolis Work House for the defendant.

Schuster's illegal practice of healing in this State came to light following his making complaint in Chicago against one William W. Blyth, charging Blyth with swindling him out of $2,050.00 for a fake medical license. Schuster claims to have been ordained a German Lutheran minister in 1909, at Pittsburgh, Pa. He also claims to be a member of the Naturopathic Association, and he appears in a picture of the delegates to the National Naturopathic Convention held in Milwaukee, Wis. Schuster's place of business in Minneapolis was at 4256 Park Ave. On being questioned by a representative of the Minnesota State Board of Medical Examiners, Schuster admitted that he had been twice previously convicted of practicing medicine without a license; in 1921 at Youngstown, Ohio, and in 1928, at Chicago, Illinois.

Splendid coöperation was received from Leo J. Gleason, Assistant County Attorney, who represented the County Attorney's Office in this matter. While this was the first medical case disposed of before Judge Rue, who is one of the newer members of the Hennepin County Bench, the warning issued by the Court to the defendant clearly indicates that the Court intends to deal severely with unlicensed practitioners and particularly those who have prévious convictions.

OBITUARY

Dr. Sidney S. Hall

1844-1932

Dr. Sidney Storrs Hall, eighty-eight years old, died at Eitel hospital, Minneapolis, Saturday, May 7, 1932. Dr. Hall was a physician and surgeon for fifty-seven years, retiring in 1924. Surviving are two sons, Edwin C. of Milwaukee and Robert S. of Cleveland Heights, Ohio, and two daughters, Mrs. James A. Older, Portage, Wis., and Miss Jennie Hall, supervisor of science in the Minneapolis elementary schools.

Interment was in Ripon, Wis.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

No one questions any further the obligation of the medical profession to supply the press and the public with authentic medical news. The necessity, also, for quoting individual physicians must be recognized by any reasonable body of men.

The question is not now: do these obligations exist? but: how can they be accomplished so that the press, the radio, and all lay publications can be amply supplied with authentic medical news while the public is, at the same time, protected against publicity seekers within the profession and charlatans without.

The regulations printed below were recently adopted by the Sedgwick County Medical Society of Wichita, Kansas. They should prove interesting reading for any society that is still struggling with this ticklish problem:

I. Requests received by individual members for expressions of opinions on medical matters by newspapers or reporters shall be referred to the executive secretary of the Sedgwick County Medical Society to be placed before the Committee on Medical Ethics and Good Will Preferably such information shall be given to the press in the name of the Sedgwick County Medical Society without the mention of individual names. Whenever this is impossible, the phrase, "Dr. So-and-So, speaking for the Committee on Public Education, of the Sedgwick County Medical Society," should be used.

Requests received by individual members for a medical opinion or endorsement of a commercial commodity or any request for a public statement in which the authority of the individual's opinion rests upon the fact that he is a medical man, shall be referred to the executive secretary of this Society to be placed before the Committee on Medical Ethics and Good Will for its approval. Preferably such information should be given to the press in the name of one of the standing committees of this Society.

II. Any Society Member who, by invitation or upon his own initiative, writes an article on a medical topic for publication in the lay press or to be broadcast over the radio, shall submit the said article to the Committee on Public Education prior to publishing or broadcasting it.

III. No Society member shall broadcast an article over the radio, or issue it directly or indirectly to a lay publication, without the approval of this committee.

IV. Any Society member who publishes an article on a scientific subject in the lay press or broadcasts it over the radio shall use only title .in conjunction with his name to establish his authority to speak on the topic in question.

V. Any officer or chairman of a committee of the Sedgwick County Medical Society who writes an article in the lay press or delivers a speech over the radio on an extra-scientific subject shall use only the title of his office and not any of his personal titles.

VI. This Committee will approve all authentic scientific articles which are not of a self-aggrandizing nature.

VII. To guide physicians who desire to write articles for lay consumption, the following definitions are submitted:

a. Permissible medical publicity is the issuance of a public report concerning an event of general interest or importance. It stresses the happening rather than the individual.

b. Undesirable medical publicity is the publication of individual activities designed to magnify the importance of that individual in the eyes of the public.

c. Propaganda is a systematic effort to gain public support for public health activities.

d. Public Health education is the impartial instruction of the public in facts relating to the prevention and treatment of disease. It stresses the facts rather than the individual presenting them.

MISCELLANEOUS

REPORT OF THE MEDICAL SCHOOL 1930-31

To the President.

Sir: I have the honor to submit the following report:

STUDENT BODY

The number of medical students varies little from year to year. We can always more than fill our limited classes from the large number of applicants.

There is a growing sentiment that we should diminish rather than increase the number of students. Practically all the faculty feel that the number is too large for the best teaching. There is a growing conviction also, both in the school and among the alumni, to the effect that too many physicians are being graduated. I have the impression that our graduates are finding it progressively harder to find a suitable location and earn a living. An overcrowded profession means a degenerating profession: this is particularly true in Medicine, where the opportunities of entering related professions are almost non-existent. The temptations ordinarily not listened to become overwhelming in the presence of adversity. It is not good public policy to educate more doctors than the country requires. This question will doubtless receive faculty consideration in the near future.

FACULTY

As noted in the President's report for 1928-30, Dr. Frederick C. Schlutz resigned as Professor and Head of Pediatrics at the close of the school year of 1930. This place was filled as of October 1, 1930, by the appointment of Dr. Irvine McQuarrie, previously Associate Professor at the University of Rochester. This appointment is universally accepted as a very happy one.

Dr. Richard E. Scammon resigned as Professor of Anatomy at the close of the Summer Session, 1930, to accept the Deanship of the Division of Biological Sciences at the University of Chicago. At the end of the school year of 1930-31 he returned to Minnesota as Dean of Medical Sciences. He shares with Dean Lyon the administration of the Medical School, having charge of matters of finance and policy. Everyone rejoices to welcome back Dean Scammon.

To Dr. Scammon's professorship in the Department of Anatomy was appointed Dr. Edward A. Boyden, Harvard man, previously Professor of Anatomy at the University of Alabama. With the transfer of Professor Hal Downey from Zoology to Anatomy, and the return of Dr. Scammon, our Department of Anatomy now has five full professors and is as strong as any in the country.

An important addition to the Department of Medicine is Dr. Hobart A. Reimann as full-time Associate Professor. Previously for three years he was Associate Professor of Medicine in the Pekin Union Medical College. He is interested in the bacteriological side of disease.

In the fall of 1930 Miss Marion Vannier resigned as Director of the School of Nursing and Miss Katharine J. Densford, Assistant Dean of the Illinois Training School in Chicago, was appointed.

KIDNEY SYMPOSIUM

Following the plan of the Physiology Symposium of the summer of 1929 was another on kidney problems, scientific and clinical, in July, 1930. The program was arranged by a committee under Dr. Hilding Berglund's chairmanship. Foreign participants were Dr. F. Volhard of Frankfort, Dr. Paul Rehberg of Copenhagen, and Dr. I. Snapper of Amsterdam. Several scientists from American universities as well as local faculty members also contributed. The attendance was good. The collected results are to be published as a monograph.

COMPREHHENSIVE EXAMINATIONS

The plan of comprehensive examinations adopted in 1929-30 went into full effect in 1930-31. The wisdom of putting all examinations under one Chief Examiner is amply demonstrated, and Dr. A. T. Rasmussen has shown his extraordinary capacity to carry forward such an enterprise. The faculty has yet to develop the technic for the best type of papers, but the experiment is promising.

SUMMER JUNIOR PROGRAM ABANDONED

For some years a division of the junior class has been in residence in summer and graduated in December of the year following. This plan has been discontinued. Hereafter all juniors will be taught together during the regular session. Seniors will be taught in four divisions, one graduating in March, the others in June. Economy of effort and the belief that sufficient good internships would be available April 1 and July 1, dictated the change.

RESEARCH

The medical research program, greatly aided by the special legislative appropriation of $25.00 a year, has actively continued. The yearly contributions are a credit to the school, constitute an active leaven in the student body, bring out our best young men and women, and in the long run help scientific progress and raise the level of medical practice.

BASIC SCIENCE BOARD

By statute the State Board of Examiners in the Basic Sciences is closely allied with the university, two professors of the medical faculty being members. During the year Dr. J. C. McKinley was appointed by the Governor, in place of Dr. E. T. Bell, and was elected Secretary-Treasurer. Dr. C. M. Jackson was re-elected President of the Board.

Dean Scammon will report for the year 1931-32.

Respectfully submitted,
E. P. Lyon, *Dean.*

SOCIAL INSURANCE

Edward H. Ochsner, M.D.
Chicago

QUALITY OF MEDICAL SERVICES DETERIORATES UNDER COMPULSORY HEALTH INSURANCE

In preceding articles Social Insurance as a whole has been considered. In this and subsequent articles our observations will deal more particularly with Compulsory Health Insurance, one phase of Social Insurance. The chief danger to medical progress and efficient medical service to the American public comes from that small group who wish to establish lay bureaucratic control over the private practitioners of medicine and dentistry.

The state exercises a legitimate and proper function in public hygiene and sanitation, the teaching of personal hygiene in schools and colleges, in the medical care of paupers, criminals, and the indigent in general, but whenever and wherever it has entered into the private practice of medicine it has always resulted in inefficiency. Even in institutional work, with the possible exception of University Clinics, the medical service rendered by the government is rarely excellent or even good, nearly always mediocre and oftentimes even worse.

The health, happiness, prosperity, and efficiency of the citizenship of any nation depend more upon the integrity, ability, unselfishness, and enthusiasm of the medical and dental professions and upon the quality of medical and dental services rendered to the people than upon any one other factor. Any change in the practice of medicine and dentistry which will in any way hinder these professions from giving their best services will eventually react unfavorably upon the whole nation. That state medicine and Compulsory Health Insurance actually will and does lower the general quality of medical and dental services is supported by reason and experience. While it may level up a little from the bottom it unquestionably levels down from the top and it is this leveling down that will surely stop medical progress.

Medical progress depends not so much upon the rank and file of the profession as upon occasional great men with vision. If we unduly hamper these great medical minds, medical progress must cease. The quality of medical services received by the people in general depends in large measure upon the quality of teaching which the rank and file of the profession receive and upon the enthusiasm and the ideals which are instilled into them by their teachers. Men of great ability can do their best work only if absolutely free, and a physician under lay bureaucratic control never is entirely free. Andrew Carnegie, one of the most successful men of modern times in the best sense of that word, makes the following statement in his Autobiography: "Thereafter I never worked for a salary. A man must necessarily occupy a narrow field who is at the beck and call of others."

One of the continually recurring misstatements in the Compulsory Health Insurance propaganda is that it encourages personal hygiene and consequently disease prevention. Nothing could be farther from the actual facts. Which person is more likely to take care of his teeth—the one who gets his dental services free, or the one who has to pay for it out of his own pocket? Those who claim the former just do not know human nature.

One of the chief causes of wonder of the Germans during the World War was the splendid condition of the teeth of the American soldiers as against the almost universally poor teeth of the Germans. Why this great difference? The chief and principal reason is that American citizens have their teeth taken care of by private dentists who take a very personal interest in each individual patient. Most American dentists and physicians are spending much of their time instructing their patients in general and oral hygiene. Contrast this with the work of the Krankenkasse physician of Germany who asks his patient one or two questions, then reaches into a file, hands him a typewritten prescription and gets rid of him just as quickly as he can and as he must, if he is to see fifty patients in an afternoon office period of two hours; and this he is by force of necessity compelled to do if he is to make a living for himself and his family at twelve cents an office consultation. Then again the claim is made that Compulsory Health Insurance examinations are more thorough. This, too, is a statement contrary to fact and to reason when one realizes that the sort of office consultation above described gives the physician the same pay as a thorough physical examination does. No man can afford to make a careful, painstaking examination for twelve cents—not even in Germany, where living expenses are almost as high as in this country. One "Krankenkasse" physician in Berlin told me personally that he made twenty-three house calls in four and one-half hours or at an average rate of one in a little less than twelve minutes, driving from house to house, going up from one to four flights of stairs each time, examining a patient and prescribing for him.

Brend states that in England the average time spent by panel physicians in making a diagnosis is from three to four minutes. Another English writer in commenting on the above facts rightly observes that these are not abuses of Compulsory Health Insurance but inherent faults of the system.

We have all repeatedly seen and heard the statement that seventy per cent of the American people—namely, the low and moderate income classes—are not getting adequate and efficient medical services. Where those who make this statement get their statistics no one has ever been able to find out. The fact is that there are no statistics available on this point. From this it must be evident that the only place they can get these figures is from the depths of their fertile imaginations.

If we stop to investigate the source of these statements, we invariably find that they emanate from two classes of individuals—namely, a certain type of ultra medical specialist whose only experience is or has been with the extremely rich, whom he charges fancy, exorbitant fees, and with paupers, whom he treats in charity hospitals. As a consequence, he has had no personal experience with patients with moderate incomes and has no right to express an opinion on this subject. The other class who repeat these figures are usually persons who never have had personal experience with the practice of medicine and hence their opinions are practically worthless.

I maintain that the poorer classes of patients get better services in this country than they do in those countries of the world that have Compulsory Health Insurance and that their medical requirements are at least as efficiently met as are their food, clothing and particularly housing requirements. This phase of the problem is an economic one and cannot be solved by a palliative such as Social Insurance.

(The effect of Compulsory Health Insurance on the quality of medical services will be further discussed in the next article.)

REPORTS AND ANNOUNCEMENTS *of* SOCIETIES

INTERNATIONAL CONGRESS ON BILIARY DISEASES

Under the auspices of the Association for the Development of Medical Relations between France and other nations a series of symposia on ailments of the liver and biliary tract will be held at Vichy, France, September 19-22, 1932. Authorities on the subject will take part in the discussions. For further information address Dr. Frank Smithies, president of the Congress for the United States, at 920 N. Michigan Avenue, Chicago, Ill.

HENNEPIN COUNTY SOCIETY

At the recent election held at the Society's club rooms in the Medical Arts Building, Minneapolis, the following officers were elected for the coming year, to take office October 1, 1932: President, Erling W. Hansen; first vice president, P. A. Stewart; second vice president, R. R. Cranmer; secretary-treasurer, A. J. Campbell; librarian, A. S. Hamilton.

New members of the Executive Committee are S. H. Baxter and J. F. Corbett. A. E. Booth and F. A. Erb were named to the Board of Censors. Olga S. Hansen and Leo Rigler were elected to membership on the Ethics Committee, and A. E. Hedback and T. A. Peppard to the Board of Trustees.

Delegates to the State Convention are E. L. Gardner, J. H. Simons, and C. A. McKinlay, with Reuben Johnson, E. K. Green and John O. Taft as alternates.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held in Rochester on September 12. It will be a one-day meeting. A good program is being planned and it is expected that the meeting will be well attended.

As previously, the Association awarded a medal to a graduating medical student at the University of Minnesota who has shown the greatest proficiency in the clinical fields of medicine and surgery during his junior and senior years in the medical school. The award this year went to Dr. Herbert Schmidt of Minneapolis. In addition the Association this year gave a cash award of $100 to the recipient of the medal. The two awards were presented to Dr. Schmidt on Cap and Gown Day.

M. C. Piper, M.D., Secretary.

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

At the meeting of the Women's Auxiliary, held during the American Medical Association meeting in New Orleans, Mrs. James Blake of Hopkins was elected President, and Mrs. S. S. Hesselgrave of Saint Paul was elected Secretary.

LADIES' AUXILIARY OF COUNTY MEDICAL SOCIETY GATHERS

An interesting meeting of the ladies' auxiliary of the Blue Earth County Medical Society was held in the library of Mankato Clinic Monday evening.

The doctors' wives demonstrated their willingness to practice their husbands' preachments and took heed of recommendations for annual physical examinations.

At the conclusion of the meeting, the doctors, who were assembled at St. Joseph's hospital, joined the group for a social time and refreshments.

Dr. and Mrs. V. Counseller of Rochester were guests of honor. At the Medical Society session, Dr. Counseller was the principal speaker and presented a paper of interest.

TOLYSIN—NOT A NEW DRUG

Although the advertising creates this impression, Tolysin is not a new drug. Tolysin is simply the brand name of the Calco Chemical Company for neocinchophen, the ethyl ester of paramethyl phenylcinchoninic acid. The proprietary brand "Novatophan" was introduced in medicine long before Tolysin was made by the Calco Chemical Company. Tolysin was the first brand of neocinchophen to be manufactured in the United States. Neocinchophen-Abbott, Neocinchophen-Benzol Products Co. and Neocinchophen-Squibb are described in New and Non-official Remedies. Tolysin does not stand accepted. (Jour. A. M. A., April 9, 1932, p. 1322.)

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of March 9, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 9, 1932. Dinner was served at 7 p. m. and the meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were 49 members present.

Minutes of the February meeting were read and approved.

Dr. L. E. Daugherty read the Necrology Committee's report on the death of Dr. H. Longstreet Taylor:

Dr. Henry Longstreet Taylor, 1857-1932

Henry Longstreet Taylor, son of David Hendrickson Taylor and Laura Carroll Taylor, was born August 19, 1857, at Cincinnati, Ohio. His boyhood was spent in Cincinnati. He attended Haverford College at Haverford, Pennsylvania, receiving a B.A. degree in 1878. The year 1878-79 was spent at the University of Berlin. Returning to this country he matriculated at the Medical College of Ohio, from which he was graduated in 1882. For the next three years he pursued postgraduate medical studies at the Universities of Strassburg, Vienna, Berlin and London. During this period, Dr. Taylor studied under some of the greatest medical authorities in Europe, among them Koch and Lister. In 1885 he entered practice in Cincinnati and was appointed Associate Professor of Surgery at the Medical College of Ohio. On the basis of postgraduate work done in America and Europe, Haverford College granted him a Master's Degree the same year.

Ill health forced Dr. Taylor to give up his practice and his position in the Medical School in 1889. He spent the next four years in practice at Asheville, North Carolina.

Dr. Taylor came to St. Paul in 1893 and remained there until his death January 2, 1932. During the early years in St. Paul he specialized in diseases of the nose, throat and lungs. As time went on he became more and more identified with lung diseases, particularly the study and prevention of tuberculosis. It is safe to say that previous to 1901 the treatment of tuberclosis was little better than it was before Koch's discovery of the tubercle bacillus. It was in this year that the Governor appointed a commission, with Dr. Taylor as Chairman, to investigate the need of a state sanatorium. Two years later the legislature created a permanent Advisory Commission on which Dr. Taylor served until 1918. The state sanatorium was opened in 1907. These commissions developed and put into operation the Minnesota plan of state and county sanatoria, which is the equal of any system for the care of the tuberculous in this country. Dr. Taylor was the dynamic force on these commissions and it was through his energy and perseverance that the present plan for the care of those afflicted with tuberculosis was made possible. He maintained that the State Sanatorium should be for the care of early cases whose chances of recovery were good and that the county institutions should be primarily for the more advanced cases. He realized early that the advanced case of tuberculosis in the home was a real menace to the family and community and, furthermore, that a high mortality rate in a sanatorium did not necessarily mean that the institution was not serving an extremely useful purpose.

For the care of tuberculous patients who did not wish to go to public institutions he established a private sanatorium at Pokegama, Minnesota, in 1905. This was the first permanent sanatorium in the state; the second was the State Sanatorium at Ah-Gwah-Ching, near Walker, Minnesota. Between 1913 and 1919 fourteen county sanatoria were established in various parts of the state.

The Ramsey Country Preventorium, the third institution of its kind in the United States, was opened in July, 1915. Dr. Taylor was medical director of the Preventorium from the time it was established until his death.

In 1906, Dr. Taylor started the Minnesota Association for the Prevention and Relief of Tuberculosis. This was incorporated as the Minnesota Public Health Association in 1914. He was elected President of the Association in 1924.

Dr. Taylor was elected Vice-President of the National Tuberculosis Association in 1925 and President in 1927. He was made an honorary life member of the Association in 1930.

In recognition of his accomplishments in anti-tuberculosis work, Haverford College honored him with an LL.D. degree in 1928.

For many years Dr. Taylor was a member of the Minnesota Academy of Medicine and was President of the Academy in 1922.

Dr. Taylor was a member of the American Climatological and Clinical Association, the International Tuberculosis Union, the American Sanatorium Association, the Mississippi Valley Tuberculosis Conference, the American Medical Association and the Ramsey County Medical Society. He was one of the organizers and a past president of the Minnesota Trudeau Society and until his fatal illness was extremely active as president of the Ramsey County Public Health Association.

Dr. Taylor is survived by his widow, Mrs. Ethelberta Geer Taylor; a son, Henry Longstreet Taylor, Jr.; and two daughters, Mrs. Antonio Nicolich and Laura Carroll Taylor.

Dr. Taylor was both a student and a crusader. His life was devoted unstintingly to combating a disease that is primarily an enemy of youth and those in the most productive period of life. His grasp of the many phases of attack necessary for eradicating this disease placed him among the pioneers. His vision, courage and progressive open-mindedness to any advance in the treatment of tuberculosis have been justified amply. The low death rate from tuberculosis in Minnesota is largely due to the program evolved and advocated by Dr. Taylor more than a quarter of a century ago.

He was an early and ardent advocate of the use of roentgenology in the diagnosis of pulmonary tuberculosis and of the Von Pirquet and Mantoux tuberculin tests to discover incidences of infection in children. He used artificial pneumothorax in selected cases long before it was generally accepted in this country. He advocated extrapleural thoracoplasty years before his associates were persuaded to adopt it.

Minnesota is in the vanguard of the states in its war on tuberculosis and the Minnesota Plan is the lengthening shadow of Dr. H. Longstreet Taylor.

In the words of the great bard:

> "His life was gentle and the elements
> So mix'd in him that Nature might stand up
> And say to all the world, 'This was a man!' "

(Signed) The Committee.

Dr. J. C. Brown read the following Necrology Committee report on the death of Dr. John F. Fulton.

Dr. John Farquhar Fulton, 1856-1932.

In the death of Dr. Fulton on February 1, 1932, the Minnesota Academy of Medicine lost one of its three remaining St. Paul founders, and the first president of this Academy.

Dr. Fulton was born in York County, Pennsylvania, on April 20, 1856. He was the youngest child in a family of seven children. His father was a Presbyterian minister. His ancestry in this country dates back to two brothers, Robert and James Fulton, who came from County Donegal in northern Ireland and settled in Philadelphia about 1730. The former brother, Robert, settled in Lancaster, Pennsylvania, and his son Robert Fulton II, was the inventor of the steamboat. The other brother, James, had a son, James II, a merchant in Philadelphia, who at the time of British occupancy was forced to flee from Philadelphia and settled in York County on a farm about fifty miles south of Philadelphia. It was from this branch of the family that Dr. Fulton sprang and it was on this farm that he was born.

His early education was in three nearby rural schools, five to ten miles from the farm, and to which he walked while attending school. When he was eighteen he entered York Collegiate Institute where he attended for nearly three years in the study of Latin, Greek, mathematics, chemistry, and literature. It was while at York that his classical teacher, Professor McDougall, advised young Fulton to study for the ministry, and his parents were told that he had all the instincts and abilities for a preacher. His eyes gave out in his second year's work and Mr. Henry Small, the founder of the college, took him to Philadelphia to consult the doctors about his eyes. He returned with glasses but was not relieved from his discomfort. After missing a great deal of school at York Collegiate Institute, he went on his own account to Easton, Pennsylvania, and attempted to enter Lafayette College. His eyes troubled him so much that he returned to the farm and it was then that the Fulton's family doctor, William Smith, recognized young Fulton's interest in the functions of the body and advised him to study medicine. This he did and matriculated at the University of Pennsylvania Medical School in September, 1877. At that time he consulted the late Dr. Samuel Risley, who recognized the condition peculiar to his eyes and fitted him with myopic astigmatic lenses which he now wore with comfort. Dr. Risley and Dr. Fulton always remained fast friends and at medical conventions would be seen seeking each other. Among his classmates at the Pennsylvania Medical School were Reichert, Howard Kelly, and Whitehead. Among his teachers were Leidy, Harrison Allen, the elder Pepper, and Horatio Wood. He has related to members of this society of the lectures given by S. Weir Mitchell. In addition to his medical degree, which was granted in May, 1880, he was given a M.S. on a thesis, "Exophthalmic Goiter," and a Ph.D. degree on "Inherited Tendency and Its Treatment."

After three months' service at the Pennsylvania General Hospital doing general surgery, he went to Will's Eye and Ear Infirmary in Philadelphia, where he worked under Risley, Goodwin, Keyser, and Strowbridge. Later he served at the Old Pennsylvania Hospital, doing surgery under Gross and Agnew; the latter he always held in high esteem. Some time during 1880 he moved to Altoona, Pa., and established himself in a large practice in general medicine. Here he remained for two years with the congenial surroundings of the Jaggard family.

In 1882 the American Medical Association held its meeting in St. Paul and while attending the meeting Dr. Fulton became attracted to the surroundings in St. Paul and decided to settle there. Dr. Agnew had given him letters of introduction to Dr. Hand, one of the original founders of the Ramsey County Medical Society, and, through Dr. Hand's advice, he took over Dr. Atwood's office, located at Third and St. Peter Streets. Dr. Atwood, a competent ophthalmologist, had died a few weeks after Dr. Fulton's arrival in St. Paul. In a short time Dr. Fulton was established in ophthalmic practice. Through the enthusiasm of Dr. Fulton, Mr. Edward Jaggard, a young lawyer and his life-long friend, was induced to come to St. Paul and subsequently became judge on the Supreme Bench.

In 1888, Dr. P. H. Millard and Dr. Fulton conceived the idea that a medical school should be developed in connection with the newly established Minnesota State University, and, in 1889, they succeeded in getting a bill through the legislature appropriating $100,000 for the first building. The initial organization of the school was undertaken by four members, Drs. Fulton, P. H. Millard, R. O. Beard, and C. Eugene Riggs. Dr. Fulton held a chair of Ophthalmology and Otolaryngology in the Medical Department from 1888 until the time of his death. Dr. Fulton opened the first out-patient clinic for the treatment of indigent patients in connection with the new Medical School. There was an announcement made to the effect that Dr. John F. Fulton would meet, at a certain hour on Tuesdays, any such patients afflicted with diseases of the eye, ear, nose, and throat.

Dr. Fulton was secretary of the Ophthalmological Section of the American Society in 1886; member of the Council of the Otolaryngological Section of the International Congress which convened in Washington in 1887; the first president of the Minnesota Academy of Medicine in 1888; president of the Ramsey County Medical Society in 1893; secretary of the section on Laryngology, Otology, and Rhinology of the American Medical Association in 1893-94. During the administrations of Governor Knute Nelson and Governor David Clough he was surgeon-general to the State of Minnesota.

Dr. Fulton was married to Miss Edith Wheaton, sister of Drs. Robert and Charles Wheaton, in St. Paul, April 11, 1888, who survives him. He is also survived by five children, four daughters and a son, and one sister.

Dr. Fulton was a man rather under average size with a kindly interest and engaging manner in conversation. Whenever he spoke of some outstanding man in the medical profession whom he had met, and he knew many of them, he usually had some interesting anecdote to relate, often quoting the exact words of the speaker on that particular occasion. In addition to his broad grasp and profiund understanding of the special field of medicine to which he devoted his life, Dr. Fulton's personality posessed a charm that made for him uncounted friends. To the members of the medical profession he was a continual stimulus. He was always interested in the careers and in the welfare of the younger men in the profession, and he sought always to encourage them in their struggles for recognition. Not only was he great as a physician but he was a true friend.

Dr. Fulton made it his business to attend regularly the various society and academy meetings and to take part in the presentation of papers and the discussions, nor did he fail to recognize and commend any meritorious work of his colleagues and especially of the younger men.

He was very much interested in protein therapy and contributed several papers to its use in iritis and other eye diseases. He was a willing auditor in all fields of medicine and was interested in and well-posted on the world's history and present political and economic conditions.

He practiced his profession until within two weeks of his death. As a member of this Academy we will always remember Dr. Fulton as a most kind and generous associate, giving of his time freely and of his experiences generously. The members of the Minnesota Academy of Medicine extend their sympathy to Mrs. Fulton, her son and daughters in their bereavement.

(Signed) The Committee—
S. Marx White,
J. S. Gilfillan,
John C. Brown, *Chairman.*

The scientific program consisted of the following:

Dr. Clayton K. Williams (St. Paul) read his thesis, entitled "Non-Specific Protein Therapy."

DISCUSSION

Dr. S. E. Sweitzer (Minneapolis): I was very much interested in Dr. Williams' paper on foreign protein therapy and I imagine it has a wider application in dermatology than in other branches of medicine. It has been classed as "fever therapy" and, in the larger application, the elevation of the temperature is the important part, but in certain phases of foreign protein therapy we can give infinitesimal doses and get results without any fever at all. In fever therapy we have the use of malaria in certain diseases like paresis. Dr. Williams also mentions milk; it being one of the first of foreign protein measures. That has been used largely in eye diseases, and typhoid vaccine has been given intravenously in arthritic conditions due to gonorrhea. Recently I had a patient in the hospital with gonorrheal keratoderma all over the feet. He also had gonorrheal arthritis, but had received no particular benefit until we used typhoid vaccine. We gave him this and the keratoderma disappeared and the joint involvements slowly diminished. He finally got out of the hospital with no stiff joints although it took a long time. The use of foreign proteins in infinitesimal doses is not so well known, although we use it in certain dermatological conditions. We also give certain foreign proteins intradermally and get a more intensive reaction and better results in some cases.

Dr. F. R. Wright (Minneapolis): The Doctor mentions several cases of gonorrheal rheumatism. The results depend upon the reaction of the disease in the urethra. As a principle, it is impossible to cure any metastatic disease without curing the focus from which the metastases arise. Whether it is the rest in bed, or the protein injection, I do not know, but it is certainly not the temperature. A temperature of 113° is not sufficient to destroy the vitality of a gonococcus. The gonococcus, after being kept at a temperature of 113° for 40 minutes, will grow on proper culture media as well as the one that has not been submitted to heat.

Dr. Williams (in closing): Foreign protein therapy is used to stimulate the natural resisting forces. I agree with Dr. Wright that the prime factor in gonorrheal arthritis is to clear up the focus, but when you see the patient with swollen and painful joints and can give him relief by using foreign protein therapy I think it is worth trying. The question of fever being the prime factor in this reaction is open to argument. For instance, in using typhoid, we get a reaction in from eight to ten hours usually. In acute conditions where the resisting forces have not been taxed to the utmost, we use typhoid, but in a chronic condition where the infection has lasted for a period of months or perhaps years, I have been using milk or the split protein products. I think one dose should be given in acute cases, and get all the reaction from that one dose, but the chronic cases may require several, possibly three or four or more, before one gets any results.

Dr. Wm. F. Braasch (Rochester) reported the following case of "Recurring Renal Lithiasis."

Several years ago I reviewed the postoperative results in over 1,000 patients operated on at the Mayo Clinic for nephrolithiasis and found that stone recurred in approximately 10 per cent. Recurrence subsequent to a second operation occurred in only a few patients, approximately 2 per cent. A large number of patients were also observed in whom operation was not indicated. Among them were a few who gave a history of having passed stones repeatedly. It is evident, therefore, that repeated recurrence of stone is not common and that when it does occur etiologic factors are present other than those causing the usual single or occasional stone. Unfortunately, the exact factors involved in the etiology of lithiasis are still unknown. Observers are divided as to whether stone formation is caused by abnormal metabolism or infection. There is reason to believe that both factors may be involved. It is quite generally accepted that abnormal metabolism is the usual cause of recurrent stones composed of uric acid, cystin and xanthin. This is shown by the fact that uric acid stones will cease to form when the patient is placed on a purin-free diet. Repeated stone formation may, however, also be dependent upon infection, such as occurs with urea-splitting bacteria. It has been shown that there are several types of bacteria which have urea-splitting power. According to Eisenstaed, staphylococci having such properties are most frequently found in conjunction with renal stone, while Grossman has found that Bacillus coli are predominant. Recent bacteriologic studies at the Mayo Clinic by Hager and Magath have shown that infection with proteus ammoniæ is often the direct etiologic factor in the formation of phosphatic stones. That some anatomic factor causing retention in a calyx, the renal pelvis, or the ureter may be a primary factor permitting such infection is also possible. Most recurring stones of this type are composed largely of calcium phosphate. Renal stones composed of fibrin are exceedingly rare, and particularly so in cases of repeated stone formation.

The case which I am reporting tonight is one with frequently recurring stones composed largely of fibrin, involving both kidneys and apparently caused by renal infection with proteus ammoniæ.

The patient, female, aged 24, was well until March, 1930, when, three months pregnant, she developed severe left renal colic, which was followed by several minor attacks of pain. Shortly after delivery in August, 1930, she had repeated severe left renal colics accompanied by pyuria. X-ray examination showed a shadow about 1 cm. in diameter in the pelvis of the left kidney. On cystoscopic examination evidence of infection was found in the left kidney; the right was quite normal. A left pelviolithotomy was done elsewhere in December, 1930. The stone removed was composed of soft, spongy material combined with a phosphatic deposit.

Within two months the pain reappeared in the left kidney and roentgenograms again showed a large recurring stone. At operation in March, 1931, the kidney was found to be small and deformed, with a dilated pelvis which was filled with a soft material, and nephrectomy was done. Following this operation the patient made an uneventful convalescence and was quite well for three months. In August, 1931, she had her first pain referred to the right kidney area, accompanied by anuria for sixteen hours. A roentgenogram was negative. An intravenous urogram showed a large filling defect in the pelvis and a diagnosis of a large soft stone was made. In September a large fibrin calculus was removed. The pelvis of the kidney was lavaged with salt solution and ureteral bulbs were passed up the ureter. She was in good condition until two months later, when she had a recurrence of her symptoms and the X-ray again showed a large indefinite shadow in the right kidney area.

The patient came to the Mayo Clinic on December 3, 1931. She had been in bed during the last few weeks and complained of considerable tenderness in the right kidney region. Our X-ray studies corroborated the previous finding of a large soft shadow in the right kidney area. An intravenous urogram showed the pelvis to be almost entirely filled with calcified material. There was evidence of renal insufficiency as shown by a blood urea of 69 mg. The necessity of immediate removal of the stone was evident and this was done by Dr. Judd on December 11. The kidney was inflamed and friable, and was bound down by perirenal adhesions. The pelvis of the kidney was filled with a soft fibrinous mass which was removed in pieces. Chemical analysis of the stone and microscopic sections showed that it was composed almost entirely of fibrin. Throughout its substance there were a number of small deposits of calcium phosphate crystals.

Four weeks after operation the patient again passed a soft stone, 2 x 1 cm. in diameter, composed of fibrin, with numerous deposits of calcium phosphate crystals scattered throughout its substance. Following this she passed three stones of a similar nature at intervals of ten days to two weeks, attended by renal colic. Subsequent to this on two occasions she passed a fine, powdery, white substance which on analysis was found to be composed of almost pure crystals of calcium phosphate. X-rays have been persistently negative until six weeks ago, when a roentgenogram showed an oval shadow in the right renal area, with a fair degree of density and about 2 x 1 cm. in size. This has remained stationary in size since, as shown by subsequent films, and has caused no pain in the kidney.

In view of the almost malignant growth of the stone, it was first thought that an abnormal form of metabolism might be present and an effort was made to correct it. Because of the predominant fibrin constituent of the stones, the possibility of some abnormality in the blood was considered. A careful study of the blood was made by Dr. Watkins and nothing was found other than a moderate reduction in hemoglobin. The coagulation time and bleeding time were quite normal. It would hardly seem possible, therefore, that the fibrin deposit was the result of a blood dyscrasia. In conjunction with Dr. Russell Wilder, we examined her for possibilities of some error in metabolism. Thinking that there might be a deficiency of Vitamin A, which has been regarded as a possible factor in stone formation, this was added to her diet without any apparent effect on the subsequent course. She was also given yeast daily over a long period of time. It had been suggested that there might be a superabundance of cholesterol in the urine or blood, but chemical analysis failed to show any. Chemical tests of the urine made by Drs. Boothby and Adams showed a persistent marked reduction in the citric acid content. This was checked repeatedly and found to be consistent. Since citric acid is a solvent of calcium phosphate, it seemed advisable to attempt to overcome this deficiency by the introduction of large amount of citrates. This was tried over a period of several days without any change in the chemical composition of the urine.

Following the operation cystoscopic examination showed the presence of some 25 or 30 c.c. of residual urine with some slight obstruction at the ureteropelvic juncture. This area was repeatedly dilated by means of large ureteral catheters and bulbs. As a result, the amount of residual urine has been reduced to 2 or 3 c.c.

Analysis of the urine in the pelvis showed it to be extremely alkaline, the pH reading being as high as 8.6. Bacteriologic studies of the urine showed almost a pure culture of proteus ammoniæ. It is well known that proteus ammoniæ favors the deposit of calcium phosphate crystals, and it seemed probable that such infection was a large factor in the stone formation. An attempt was made to overcome the alkalinity of the urine by means of a ketogenic diet and large doses of ammonium nitrate. In spite of this the pH of the urine never was brought to an acid level and seldom went below 6.4. She was unable to tolerate this treatment over a great length of time because of gastric upset.

In our effort to overcome the proteus ammoniæ infection, we established continuous drainage of the renal pelvis over a period of three days and lavaged the pelvis with strong silver nitrate solution, without materially affecting the bacterial growth.

An attempt was made to dissolve the reforming fibrin stones by means of lavaging the pelvis with karoid, which is an enzyme employed in destroying dead organic material. We used this in a solution as strong as 10 per cent, but were unable to make an impression on the stones. On the supposition that the stone now present is composed of calcium phosphate, we have recently lavaged the renal pelvis with phosphoric acid, in a solution of 1 and 2 per cent, as suggested by Randall. Although so far this has not affected the stone, it has apparently been a large factor in reducing the infection in the renal pelvis. At one time recently microscopic examination of the urine catheterized from the right kidney showed no pus or bacteria.

The patient's general condition is now apparently normal. She is voiding a normal amount of urine, which contains a small amount of pus and many proteus ammoniæ. The urine is less alkaline than formerly, the last pH reading being 6.9. Her last blood urea estimate was 28 mg.

Although the problems involved here have been difficult to solve, we feel that considerable progress has been made. It may be inferred that the renal stones were the result of infection with proteus ammoniæ. It is possible that this infection followed inadequate drainage caused by ureteral pathology arising during pregnancy. As the result of treatment received, the degree of infection and the amount of residual urine in the renal pelvis have been greatly diminished. The composition of the stone has been changed from a predominant fibrin to a definite calcium phosphatic consistency. If the stone now present can be removed, we hope that with persistent efforts free drainage from the renal pelvis can be maintained, and that the proteus ammoniæ infection, which is apparently the etiologic factor, will eventually be overcome.

DISCUSSION

DR. A. SCHWYZER (St. Paul): Only once have I seen some elastic stones that were passed, but they had a very different etiology. There was a hole in the bladder which came from a diverticulum of the sigmoid. The patient, a woman, came to the office one day with 22 stones in a box which she said she had passed in the course of two years. They were elastic.

This case is interesting as the formations are principally fibrin. If you learn that it is fibrin, you have to figure that it is of infectious character and that the infection is most probably in the pelvic mucosa. Dr. Braasch said the stone was removed by pyelotomy.

That brings to my mind one point I want to mention. For a long time I had the conviction, and Dr. Cabot when he was here a short time ago brought out the same point, that if we did a nephrotomy instead of a pyelotomy we would have less danger of a recurrence of stones, for if we drain through the pelvis we do not get a normal condition in the pelvis as long as the catheter is in there. The catheter irritates, and we do not eradicate the infection. I recall a case that had stones in both kidneys; the patient had been operated upon in Iowa in 1913 for a right-sided calculus. She had a stone at that time in each kidney. In 1918 she came to us and we found a stone in each kidney, each stone the size of a small walnut. Now she had pain in the left kidney. We operated on the left side by pyelotomy and took that stone out. She came back in 1923, and to my amazement she had large and multiple stones in both kidneys. We reoperated on the left side and removed the stones by nephrotomy. After the operation we saw a little shadow in the X-ray the size of a pea. That was in 1923. I have seen her rather recently (within the last year) and that shadow has remained exactly of the same size as it was in 1923. As I said, the second time we made a nephrotomy and put in two fine catheters side by side through the cortex. We left them in for about a week until we felt sure that we had the infection taken care of. We instilled daily nitrate of silver, and after the tubes were removed, did this from below a number of times. Thus this patient had two pyelotomies and the condition became worse than before. After an extensive nephrotomy, she is now in good condition and the urine is practically clear. In these cases if we operate by nephrotomy we have more of a chance to eradicate the infection. It is in the pelvis that these stones form and the less we damage the pelvis the more chance we have of curing the condition. I notice Dr. Braasch stated that in his case there was a rather large pelvis. There is probably a little stricture in the passage between pelvis and ureter.

Dr. F. R. Wright (Minneapolis): Stones in the genito-urinary tract are of two varieties: either primary or secondary stones. Secondary stones which are formed, are lime salts which are precipitated from the urine usually accompanying an alkalin fermentation. In studying the production of stones we overlook the fact that the urine is not water. It is a solvent for lime salts. When the solvent qualities of the urine are destroyed, the urine loses its ability to hold lime salts in solution that are precipitated to form stones. It is possible, where secondary stones are formed in the pelvis of the kidney, that the urine secreted by that kidney is normal, but that its solvent quality is destroyed by the products of infection which is present in the plevis or in the bladder.

I have under observation at the present time a girl who gives the following history: She is a high school girl; three years ago while in school we found that she had a stone in the right kidney. That was in 1929. We removed that stone and she got along fine. She came in the other day not feeling very well. Upon investigation we found that she had three small primary stones in the right kidney and two or three in the left kidney. Some metabolic function which produced the stone in the right kidney in the beginning has now gone far enough to produce stones in the left kidney, which was normal at the time the right kidney was operated.

Dr. Braasch (in closing): I want to thank the gentlemen who discussed this case report. In answer to Dr. Schwyzer's question as to the advantage of nephrotomy, it is quite manifest that in this case it would be almost impossible to remove the stone through the cortex, since the stone was so large that it would be difficult to remove it that way. However, when the stone is situated in a calyx it is advisable to do a combined nephropelviolithotomy. In this case I do not think the operation was a factor in causing recurrence. Retention of urine in the renal pelvis, together with infection with proteus ammoniæ, were probably the most important etiologic factors. The importance of a urea-splitting bacteria such proteus ammoniæ in the formation of stone is not generally recognized. I think that if the stone now present is removed and free drainage is established, the infection might be overcome. A large factor in the elimination of infection is the acidification of the urine. This can be accomplished better by means of a ketogenic diet than by any other method.

Dr. Emil S. Geist (Minneapolis) gave a lantern slide talk on the operation for Knee Fusion in cases of tuberculosis of the knee.

DISCUSSION

Dr. M. S. Henderson (Rochester): The hour is late so my remarks will be very brief. I would like to say a few words about the operation of arthrodesis as applied to the tuberculous knee joints. The Hibbs operation which Dr. Geist has modified to advantage is a very good procedure. I would like to call attention to a method to obtain the same result that we have used for many years with satisfaction. The lantern slide I am showing is a drawing demonstrating how, after the knee is thoroughly exposed and as much as possible of the tuberculous tissue removed, the bone ends are shaped by sawing off the articular surface of the femur and the tibia and in such a manner that they fit accurately with the knee flexed to about 170 degrees, as advocated by Dr. Geist. A step that I am sure has hastened the securing of bony union in our cases is a thorough roughening of the soft spongy bone on the femur and tibia, doing this with a gouge. When the bone ends are put together these roughened areas come in contact and hasten union. In addition to this a bone graft is placed across the front of the line of contact of the femur and tibia as illustrated in the lantern slide. The bone graft, obtained from the lower end of the femur, is spongy bone and so is very well suited for such a purpose. Wire nails are driven from below upward through the tibia into the femur to steady the position of the leg while the cast is applied. They are left protruding and are painlessly withdrawn three weeks after operation, when a window is made in the cast and the stitches also removed. The balance of the postoperative treatment is similar to that outlined by Dr. Geist. These operations are really very successful. Dr. Geist did not have time to discuss the ultimate fate of these patients. We found that over a period of years, three to fifteen or more years, about 8 per cent died of dissemination of their tuberculosis. During this period, however, they were free of all pain in the knee and led a comfortable existence.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

PROCEEDINGS MINNEAPOLIS SURGICAL SOCIETY

Stated meeting held April 7, 1932*

Vice-President, Dr. E. K. Green, in the chair.

The following scientific program was given:

1. Dr. E. T. Evans (by invitation) read a paper on Acute Osteomyelitis:

Acute osteomyelitis is an acute surgical disease upon the early diagnosis of which depends, in a large measure, the institution of adequate treatment conducive to its alleviation.

In this paper the author does not intend to repeat the diagnostic points of acute osteomyelitis but rather to enlist his hearers as crusaders in the cause of surgery. For long, acute appendicitis was in the realm of medical therapeutics and it was only as the result of a long crusade that the medical treatment gave way to surgery, until now all branches of the profession are surgically minded in that respect.

SUMMARY OF DIFFERENTIAL POINTS IN THE DIAGNOSIS OF ACUTE OSTEOMYELITIS, SUPPURATIVE ARTHRITIS, AND RHEUMATIC FEVER

History	Acute Rheumatic Fever 15-35 years	Acute Suppurative Arthritis 1-5 years	Acute Osteomyelitis 5-15 years
Onset	Gradual, often with sore throat	Acute	Sudden with chill
Trauma	Usually none	Often associated	Nearly always present
Predisposing infection	Tonsillitis	Ear infection and tonsillitis	Skin trouble and tonsillitis
Pain	Moderate, severe, improved with heat	Severe, sleepless; unrelieved by local measures	Intense, throbbing, like toothache; heat no value
Temperature	Gradual rise and moderate curve	Rapid rises—high curve	Immediate rise and very high
Pulse	Moderate increase	Rapid, 125-150	Very rapid, 140-180
Prostration	Moderate	Great	Greatest
Examination			
Location	Multiple joints	One joint, usually knee or hip	One focus not in joint—usually tibia or femur
Appearance	Joints enlarged and red	Little or no redness, swelling follows joint capsule	Nothing early—general local edema later
Tenderness	General over joints	Excessive over joints	None over joints—acute over bone
Fluid	Little or none	Tense with fluid—aspirated—pus	None in joint early
Movement	Painful	Extreme muscle spasm	Careful movements not painful

The differential diagnosis of acute osteomyelitis lies as a rule between acute rheumatic fever and septic arthritis. The disease is blood-borne and attacks the metaphysis of the bone. Joints become involved only by sympathetic effusion when the metaphysis lies within it as in the knee, elbow, and hip, or by direct extention as so frequently occurs in the hip.

A slide was shown showing certain salient features of diagnosis.

That these errors of diagnosis do occur and that crusading in this subject must be incessant in order to make all the profession surgically conscious is brought out by a review of sixty-seven cases of acute osteomyelitis treated in this hospital.

There were twenty-one females and forty-six males from one to sixty-seven years of age; 77.6 per cent were under eighteen years of age.

In 67 per cent a single bone was involved, the large bones as usual predominating: femur 24, tibia 20, humerus 11, radius 2, ilium 2, miscellaneous 8.

The submitted diagnoses of these cases ranged all the way from teething to infantile paralysis and erythema nodosum. Some 34.3 per cent were diagnosed rheumatism; 14.9 per cent were diagnosed septic arthritis at some time in their course.

The average time from onset to diagnosis (excluding cases running over 100 days) was 25.3 days. Sixteen of the cases, or 24.2 per cent, were diagnosed within one week and an additional thirty-five cases, or 52.2 per cent, within two weeks. But of the first, only eleven cases, or 16.4 per cent, and of the latter only sixteen cases, or 24.2 per cent, were diagnosed by the attending physician prior to admission. Therefore, a total of 29 per cent were undiagnosed within two weeks until admission to the hospital.

On admission to this hospital, the diagnosis was missed in nine cases, all of which were diagnosed within twelve days and seven within a week.

Dr. Evans said the point he now wished to stress is that fifty-eight cases were diagnosed correctly on admission and immediate treatment instituted. The diagnosis was made by the admitting intern and based on the criteria shown on the slide. This is not because our interns are extraordinary but rather because they are osteomyelitis-conscious at this period of their training. Surgeons must be crusaders in keeping them so, just as our predecessors made the profession surgically conscious about appendicitis.

Dr. C. W. Waldron (by invitation) gave a lantern slide talk on "Delayed Transfer of Pedicled Flaps."

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*Meeting held in the Eustis Amphitheater of the University Hospital and the scientific session presided over by Dr. O. H. Wangensteen, Chief of the Department of Surgery, U. of M.

Dr. W. T. Peyton read a paper on Hemangioendothelioma, and showed the following cases:

Case 1. This case is a baby girl, six months of age. The child was delivered with forceps, apparently a very difficult delivery, and this resulted in multiple lacerations about the head and neck. The parents attributed the present lesion to these birth injuries. It is, therefore, difficult to say whether the lesion was present at birth, but three weeks later two discolored spots were noticed in the right cheek, each about 2 cm. in diameter. These lesions seem to have fluctuated in size; certain days they would be more raised than others, but there was only gradual progression of the lesion until December, 1931, when the child was treated elsewhere with a radium pack. Four days after this treatment was given, the lesion suddenly grew worse. The child was first seen here on January 25, 1932. At that time the entire right cheek was involved with tumor mass. The skin over this mass was purplish in color. It was firm on palpation. There was increase in local heat. The diagnosis at that time was hemangioma. Treatment consisted of high voltage X-ray therapy. She was given 80 per cent S.E.D. Following this treatment it improved for about two weeks and then became more swollen and firm. The child was hospitalized for three weeks and treated with hot packs, during which time it gradually improved so that three weeks later this side of the face was not any larger than the other but it still is more firm than the other side. The discoloration has disappeared.

Case 2. This child was fifteen months of age on admission. The child was born with a mass in the right thigh. It was about 2 inches in diameter at the time of birth and grew slowly during the first four months of life. During the fifth month of extra-uterine life, or during the four weeks preceding his admission to the Out-patient Department, it grew very rapidly. The child refused to move this leg at the time of admission. Examination showed a tumor in the anterior aspect of the right thigh measuring 12x17 cm. and raised about 2 mm. above the surrounding skin. It extended from 3 cm. below the inguinal ligament down to below the patella. The skin over it was bluish in color. There was increase in local heat. It felt hard on palpation. He was given the following treatments: On January 31, 1930, 60 per cent S.E.D.; April 14, 1930, 60 per cent S.E.D.; December 30, 1931, 60 per cent S.E.D. Follow-up: The child began to use the leg after the second X-ray treatment. It has been gradually improving since the first admission and at the present time the tumor mass has disappeared. The skin is pigmented in areas, but otherwise is normal in color.

Case 3. This case was a boy fourteen years of age. He noticed a tumor over the right scapula for some time but thought it was a normal bony part. His father first noticed it in January, 1930, and at that time it was about 3 cm. in diameter. It grew rapidly and in February, 1930, the boy was seen by a physician who partially removed the tumor, stating complete removal could not be done on account of hemorrhage. Five weeks later it was more completely removed. It recurred approximately four months later (July, 1930) and grew rapidly following this recurrence. On admission here, November 28, 1930, there was a mass protruding over the right scapula, approximately 7 cm. in diameter. It was irregular in contour, ulcerated, and bled easily. X-ray of the chest showed slight enlargement of the left hilus. Hemoglobin was 56 per cent. December 6, 1930, a transfusion of 300 c.c. was given. December 8, 1930, excision of the tumor together with the right scapula was performed. December 27, skin grafts were implanted in the operative defect. January 26, 1931, 145 per cent S.E.D. was given to the skin over the scapula, anterior and posterior, in 4 treatments in 8 days. Follow-up: There has been no local recurrence but recent X-ray examination shows a large tumor mass in the left hilus. March 15, 1932, he was given 145 per cent S.E.D. to the left chest in four treatments over eleven days.

Case 4. This was a woman, aged fifty-four, who was admitted to this hospital October 5, 1928, complaining of pain on swallowing and cardiac palpitation. These symptoms were of six months' duration. Examination showed the thyroid slightly enlarged. The basal rate was minus 5. Operation was performed with a diagnosis of non-toxic adenoma of the thyroid. At operation the sternothyroid muscles on the right side were found to be very adherent to the thyroid gland. There was profuse bleeding from the thyroid gland so that no attempt was made to expose the entire gland or to remove it. A piece of tissue from the thyroid was removed for biopsy. Microscopic examination of the tissue removed for biopsy showed it to be hemangioendothelioma. On October 23, 1928, 130 per cent S.E.D. was given in two treatments over three days; December 12, 57 per cent S.E.D., and April 13, 1929, 139 per cent S.E.D. plus 30 per cent S.E.D. seven days later. Follow-up: About one month after the first therapy, pressure symptoms were so relieved that she could swallow more easily. She had never had any recurrence. This case was reported in detail by Dr. C. O. Rice in the American Journal of Cancer, 15:2301, 1931. This is apparently the thirty-fifth case of hemangioendothelioma of the thyroid and the first reported in the American literature.

Hemangioendothelioma would appear to be relatively rare, in view of the rather small number of reported cases, but it is probably much more frequent than reported, often being confused with hemangioma or sarcoma. Four cases of angioendothelioma about the jaw were reported by Withers. They were all at first considered to be sarcomas. Cushing and Bailey found difficulty in picking out their so-called hemangioblastomas because they had become scattered and lost in the list of classified tumors of the brain and were listed under the diagnosis of mascular gliomas or sarcomas.

Metastases do apparently occur in this condition. Bronzini reports a case of hemangioendothelioma of the external ear with metastasis to the cervical lymph nodes. There was a patient in this hospital some time ago who had two primary hemangioendotheliomas on the right arm with metastasis to the right supraclavicular nodes. Withers, on the other hand, reports four cases of hemangioendothelioma which involved jaws and emphasized the fact that none of these metastasized even though one case was five times recurrent following excision.

Dr. Peyton also showed a case of squamous cell carcinoma, primary in the superior alveolar process. The case was that of a male, sixty-two years of age, admitted December 1, 1929. He gave the following history. In the fall of 1927, a tumor appeared in the right upper gum. He saw a physician who cauterized the growth and applied radium at intervals of one month until July, 1928. He then consulted another physician who gave twenty to thirty electric treatments. In August, 1928, a third physician radically removed the tumor with either chemical or actual cautery, leaving open the side of the cheek. About one year later he had a flap from the neck swung up to repair this defect. The first recurrence was found in July, 1930, and recurred in the uppermost part of the right antrum. It was excised here, local excision being performed. October 13, 1930, 2,000 mc. hours of radium were implanted in the same area. March 6, 1931, there was a recurrence in the upper part of the defect in his face. On March 16, 1,100 mc. hours of radium were implanted. July 17, 1931, there was a recurrence medial to the ramus of the mandible which was treated with 2,400 mc. hours of radium. October 29, 1931, there was again a recurrence medial to the angle of the mandible and also a recurrence on the floor of the right orbit. At this time more radical excision was undertaken, removing the right half of the mandible and all of the soft parts both external and medial to this part of the mandible. This operation was followed fifteen days later by removal of the contents of the right orbit and right temporal fossa. There has been no recurrence since this extensive operative removal.

DISCUSSION

Some one asked if another plastic operation would be performed to repair the defect in the last case shown.

Dr. Peyton replied that another flap will be swung up but one should never swing a flap as early as one year after the operation.

Dr. J. M. Hayes asked if the metastases in the lung shown in the X-ray of the boy's chest had reduced under treatment.

Dr. Peyton replied that the film was taken about two weeks ago. The boy has just finished another course of X-ray therapy to this area and another film has not been taken since.

Dr. O. H. Wangensteen asked if the problem of hemostasis was a difficult one in the scapula case.

Dr. Peyton replied that it was not, because they did a very wide resection so that the tissues exposed in the operation were quite normal.

Dr. Wangensteen said that the fourth case shown by Dr. Peyton had been operated upon by Dr. Creevy. Considerable difficulty was had with hemostasis and Dr. Creevy asked Dr. Wangensteen to help him with it. The patient was under ethylene anesthesia and it was first believed that the bleeding might be due to the slight struggling of the patient under anesthesia. The anesthetic was discontinued but without allaying the tendency toward bleeding. Search was made for a substernal goiter, but none was found. Pressure was used meanwhile to control the bleeding. A deliberate incision was made into the right lobe of the thyroid with resultant alarming hemorrhage. A tentative diagnosis of hemangioendothelioma of the thyroid was made, which was subsequently confirmed microscopically. Mattress sutures were placed for hemostasis and the wound packed. Dr. Wangensteen said that Professor deQuervain had reported four such cases. This tumor was small. Sometimes they become extremely large and the patients may die from hemorrhage through erosion into the trachea or esophagus.

Dr. Melville H. Manson (by invitation) read a paper on the Diagnosis and Treatment of Perinephritic Abscess.

Dr. Manson stated that his purpose in discussing perinephritic abscesses was to stress again the fact that this condition is diagnosed only after a long interval in the majority of cases, and that mistaken diagnosis is common. He wished to report a case of bilateral perinephritic abscess.

The average duration between the onset of symptoms and hospitalization or treatment is from three to five weeks. (Peacock 38.8 days; Eisenstadt 25 days; Habein 5.6 weeks; University Hospital 22.5 days.)

Dr. Manson stated that hip disease was a common, mistaken diagnosis in perinephritic abscess and that several cases had been treated by traction and splinting before the correct diagnosis was made. Because of the marked weight loss and secondary anemia in many cases, malignancy has been wrongly diagnosed.

In the majority of cases there is no history of previous renal involvement. However, a history of cutaneous infections, sore throat, influenza, or any foci of infection, may be obtained in over 50 per cent of instances. The symptoms of chills, fever, malaise, anorexia, loss of weight and backache are constitutional symptoms present in a variety of conditions. These symptoms are usually present in perinephritic abscess before localizing symptoms are manifest, and Dr. Manson stated that the most important single factor in making the diagnosis of perinephritic abscess was to keep the condition in mind.

Physical examination may reveal little of value. Tenderness in the lumbar region, usually on the right side, slight spasm of the erector spinal group of muscles, bulging in the loin, when present, tend to confirm a diagnostic impression. The bulging may be detected by measurement from the umbilicus to the spine on each side, when otherwise it is not obvious. Dr. Manson believed that the use of an aspirating needle as an aid to diagnosis was not employed often enough. He stated that a needle should be used for confirming the diagnosis of perinephritic abscess just as frequently as it is used in diagnostic pleural aspirations. Examination of the urine is of no differential value.

X-ray examination may show valuable indirect evidence in confirming a diagnosis, the most important of which is loss of the normal psoas and kidney shadows. Upward displacement of the diaphragm, displacement of the colon and scoliosis of the spine to the opposite side may also be seen. The X-ray signs are frequently absent up to ten days after the onset of symptoms.

Bilateral perinephritic abscess, although infrequent, occurs sufficiently often so that involvement of the opposite side should be suspected in a case which is still running a septic temperature after one side has been adequately drained. The first bilateral case was reported by Stuckney in 1880. In 1924 Hunt collected ten cases and reported one case (bilateral) from 106 cases of perinephritic abscess seen at the Mayo Clinic in a ten-year period. Several others have subsequently been reported. Dr. Manson reported the following case: A male, thirty years of age, was referred to the University Hospital with a diagnosis of "probable malignant disease of the bowel." His illness began five weeks before admission, with right-sided abdominal pain of rather severe character. This was accompanied by diarrhea. His course before admission was characterized by trouble with gas, continued pain, with fever and chilly sensations. There had been no vomiting, no bloody stools, and no urinary symptoms.

Examination showed an emaciated man who had lost 16 pounds in weight and considerable strength. Temperature was 99° to 103°, and pulse 90 to 100. There was a tender, firm mass on the right side of the abdomen opposite the umbilicus which was ballotable from behind. The mass did not move with respiration. Laboratory tests revealed a hemoglobin of 69 per cent. Urine showed a few hyaline casts and an occasional white blood cell. X-ray examination of the abdomen showed a mass on the right side suggestive of renal origin. Barium enema was essentially negative, except for displacement downward of the hepatic flexure of the colon. A needle was introduced into the back between the last rib and the crest of the ilium at the lateral border of the erector spinal muscle group and thick pus was obtained. Staphylococci were present on smear.

The right perinephritic space was drained posteriorly, obtaining a large amount of pus. The patient's temperature pursued a downward trend, reaching normal on his eighth postoperative day. On the ninth postoperative day he again ran fever, which continued as high as 103°-104°. It was felt that inadequate drainage on the right side was responsible and several times under transitional ethyl chloride anesthesia the cavity was explored with a gloved finger.

On his seventeenth postoperative day it was suspected that he had a perinephritic abscess on the left side. Aspiration of this side was rewarded by pus. Drainage was established and some improvement followed. Fever persisted, however, and on the fifth day after the left lumbar region had been opened the patient developed psoas spasm. Because the left perinephritic space was draining adequately, it was thought that the pus had pocketed at a lower level along the psoas muscle. An incision was made parallel with Poupart's ligament down to the peritoneum. Retroperitoneal dissection upward met with a pocket of pus which was drained.

The patient's temperature immediately dropped to normal and after a short convalescence, during which Dakin's irrigations were employed, the patient left the hospital with the wound practically healed.

Treatment of perinephritic abscess consists of adequate surgical drainage, which results in cure in practically every case of extra-renal origin.

DISCUSSION

Dr. T. H. Sweetser called attention to the occasional difficulty in differentiating between a perinephritic abscess and a degenerating renal tumor, and the occasional presence of a perinephritic abscess in association with and secondary to a degenerating renal tumor. Such a degenerating tumor may cause leukocytosis, fever, and most of the symptoms of toxicity seen in patients with abscess. Such a tumor, if large, may also cause obliteration of the psoas abscess in the roentgenogram.

Dr. L. G. Rigler (by invitation) said he felt that Dr. Manson had mentioned the more important points. There was one he wished to add, however, and that was that other things than perinephritic abscess will obliterate the psoas muscle shadow, such as polycystic kidney, neoplasm or hydronephrosis. Dr. Rigler recalled a recent case seen at the University Hospital, and stated that massive hydronephrosis can cause this same appearance. Nevertheless, in the presence of other symptoms suggestive of an inflammatory process this sign is very important. One should keep in mind obliteration of the psoas shadow in the recognition of perinephritic abscess.

Dr. Wangensteen thought that the students were well aware of the fact that the differential diagnosis of perinephritic abscess or lesions that mimic it could not always be decisively made, and related the instance of a case that had been thoroughly studied and presented to the students as a case of renal neoplasm. When the patient was operated upon, he had a perinephritic abscess. It was Dr. Wangensteen's impression that the faculty were inclined to be a little more lenient with the students if they hedged a little on this differential since this case had been observed at the clinic.

Dr. O. S. Randall (by invitation) read a paper on The Diagnosis and Treatment of Actinomycosis.

The diagnosis and treatment of actinomycosis is of prime importance in Minnesota, Dr. Randall stated, as the disease is very prevalent in the Mississippi Valley states. To understand the various manifestations of the disease one must review the essential points in its pathology.

Actinomycosis is a granulomatous infection caused ordinarily by the streptothrix. It occurs most often in human beings and in cattle and is prone to become slowly progressive and extensive and assume a chronic course. After the infection is once established, it tends to extend by continuity and contiguity to involve any tissues with which it may come in contact. The one exception to this rule is the lymphatic system; although the regional nodes may become somewhat hyperplastic, they are only involved in the generalized type by this process. Therefore, practically the only mode for metastasis is through the blood stream, which mode is infrequent.

A very definite and fairly constant tissue reaction is set up by the infection. Two processes take place; one, the reaction by formation of dense fibrous tissue, and second, the degenerative process due to the invasion of the connective tissue by the fungus. These two are going on simultaneously—the former is a tendency to walling-off, and the latter is the advancement by suppuration, degeneration or liquefaction. The fungus colonies occupy the center of cellular activity where there are large masses of polymorphonuclear and mononuclear leukocytes, and epithelioid cells and inflammatory tissue rich in young blood vessels. When softening occurs, there is a tendency toward extensive lipoid degeneration with the production of abscesses and cavities and pus channels filled with purulent material containing yellow granules (sulphur granules). Microscopically this cellular portion may contain numerous multinucleated giant cells very much like the Langhans type. The healing process is characterized by the formation of large collections of fibrous tissue.

Regardless of where the primary invasion takes place, the process from there on gives the same pathological picture. Although Siegmund believes that actinomycotic lesions do not tend to heal, it is held by most authors that the older lesions may heal by cicatrization and by the dying out and absorption of the microorganisms. McGlannan stresses the fact that the primary focus may disappear entirely while the infection is spreading. Therefore, in some cases—in fact in a large majority—it is impossible to determine the original point of inoculation of the disease.

With these points in mind the discussion of the disease in various localities of the body becomes simplified. We ordinarily divide the disease into four types with the understanding that they may or generally do overlap one another if the course becomes extensive. The cervico-facial type is encountered in about 60 per cent of the cases; the thoracic in 14 per cent, and the abdominal in 18 per cent, with a small number of cases comprising a miscellaneous series.

The mode of infection is a debatable question. It is held by some that the disease is caused by organisms of the soil, grasses, and grains. This is substantiated by the fact that about 50 per cent of the cases are found among the rural classes. However, Lord and Wright maintain that the organism is a normal inhabitant of the gastrointestinal tract and that trauma is a very important causative agent in the inoculation.

From most textbooks today one gains the impression that the diagnosis of actinomycosis is a fairly easy one. However, Dr. Randall doubts if this is the experience of a great many, for there are any number of cases referred to general hospitals with the diagnosis of malignancy, tuberculosis and syphilis. The finding of sulphur granules is said to be pathognomonic. However, similar granules are found in chronic staphylococcus infections and others. Smears of the pus containing the crushed granules are supposed to be very reliable. True, they are, when positive, but it is often very difficult and time-consuming to reach the diagnosis by this method. The organisms are very difficult to culture and the method is somewhat impractical on the ordinary laboratory media. Serologic tests have so far been impractical.

Regardless of what method one uses, he should remember that the obtaining of a proper specimen is essential. It is the one who first observes the abscess of actinomycosis who has the best opportunity to make a correct diagnosis. These abscesses usually contain only a few cubic centimeters of pus which holds the actinomycotic colonies. After these abscesses have ruptured and a sinus persists to drain pus, it is very unlikely that one can find the colonies in such exudate.

Dr. Randall stated that for some time at the University Hospital, after incision of the abscesses the pus has been collected and centrifuged for about thirty minutes according to the type of pus present. It is then embedded in paraffin and microscopic sections are then made in the usual manner for making sections of tissue. The slide may then be studied for the large colonies characteristic of the ray fungus. Hematoxylin eosin and Gram's stains are used. The mycelia are Gram-positive.

For the most part conservative therapy, consisting mainly of saturated solution of potassium iodide and deep X-ray and radium, has been more or less unsuccessful in curing many of these cases. Therefore, in their recent cases they have attempted to eradicate the lesion by wide excision and drainage of all the affected area. The most important difficulty in the surgical removal of the lesion is the extreme vascularity of the involved portion; but if one is able to stay on the outside of the infected area, the excision is done with ease. During the last two years, five cases of actinomycosis have been treated in this manner and they are all improved or cured at this time.

The first case was a man forty years of age, with actinomycosis of the cheek. This was radically excised by the use of the endotherm. He has remained well without recurrence for two years.

The second case was in a man forty-three years of age with actinomycosis abscess at the base of the tongue. This was incised and drained. He made an uneventful recovery. Upon discharge he was given 140 per cent S.E.D. to the involved region in four treatments over eight days. There has been no evidence of recurrence.

The third case was a woman twenty-nine years of age with cervico-facial actinomycosis. This was widely excised, along with the submaxillary gland and a portion of the sternocleidomastoid muscle. When the patient was seen four months later, there was only a small abscess present. This was also completely excised, with immediate healing.

The fourth case was in a woman twenty-nine years of age with actinomycosis of the left pleura, chest wall and breast. This necessitated several operations and in doing so a large portion of the chest wall and pleura was excised as well as a portion of the breast to give adequate drainage. The patient was last seen a month ago. There is only a small sinus present. She is fever-free, feels well, and has gained weight.

The last case was a man forty-six years of age with a typical actinomycosis of the face and neck. This was radically excised. He still has some infection present and will probably need further excision but he can be kept under observation to limit the spread to the neck and to attempt to prevent spread to the lung and mediastinum.*

DISCUSSION

Dr. O. W. Yoerg stated that actinomycosis is frequently not diagnosed because it is an uncommon disease. In sections made in the laboratory, the actinomyces bodies are frequently not discovered, and he was of the opinion that it would be advisable to acquaint the laboratory of a suspected diagnosis of actinomycosis and have them make a diligent search. Sometimes one has to look a long time to find the bodies on which to make the diagnosis.

Dr. Wangensteen said he wanted to emphasize the point made by Dr. Randall relative to the advantage in diagnosis of the physician who sees the patient first. Dr. Wangensteen related the instance of a man who was referred with the diagnosis of carcinoma of the cheek. There was no evidence of an epithelial lesion within the mouth. The swelling in the cheek was aspirated with the idea in mind that it was probably actinomycosis. Sulphur-like granules were obtained and microscopic examination of the granule in a drop of water on a glass slide showed the actinomyces. The next morning Dr. Wangensteen said he demonstrated this patient to his class, and reaspirated the lesion with a needle but was unable to find the ray fungus. In a lesion that has once been tapped and has continued to drain, the organisms may be very difficult to demonstrate. The embedding of the sediment in paraffin, and examination of a block of tissue cut and stained with hematoxylin and eosin as outlined by Dr. Randall, was much more certain of success.

Concerning treatment, Dr. Wangensteen stated that prior to 1929 their results with conservative treatment as the principal therapeutic agent (X-rays and potassium iodide) were poor. Dr. Wangensteen said that he informed the man with the lesion on the cheek that he had "lumpy jaw" and believed that the lesion was best excised. The patient was a farmer and said that his cattle with "lumpy jaw" went to South St. Paul and he was prepared to accept anything advised. Of the five patients with actinomycosis seen since then, all have been submitted to surgery and all are well. One of these was a case of extensive actinomycosis of the left lung, thoracic wall and breast (lantern slides shown), necessitating four operations. Dr. Wangensteen said he felt that if abdominal actinomycosis was treated radically by surgery the results would be very much better. The disease usually leaves the cecum, where it originated, and invades the abdominal wall. Dr. Wangensteen believed that if surgeons would buckle up their courage and go after these cases of thoracic and abdominal actinomycosis (if not generalized) there would be many more cures. On looking through the literature of actinomycosis, one could not escape the impression that the results of treatment were better forty years ago before the X-rays were discovered. Too much reliance upon the value of X-rays as a therapeutic agent in these cases, Dr. Wangensteen felt, had contributed to failure in obtaining consistently better results.

Dr. Wangensteen was asked whether he used potassium iodide.

Dr. Wangensteen replied that they did use it, but felt that incision, curettement, drainage and excision were the most important. As a single therapeutic measure, he felt that potassium iodide was of doubtful value. X-rays and potassium iodide should be looked upon as adjunct measures in the treatment of actinomycosis. Schlange pointed out in 1892, that actinomycosis now and then exhibits an unusual tendency to get well spontaneously if afforded adequate drainage.

Dr. Rudolph W. Koucky (by invitation) read a paper on The Treatment of Lung Abscess.

Dr. Koucky reviewed the results of management of lung abscess at the University Hospital and the results as reported in the literature.

At the University Hospital in the years 1928 to 1932 there had been 33 cases of lung abscess diagnosed either clinically or at autopsy. It was pointed out that not all these cases could be regarded as clinical lung abscess. Only 18 of the group had been admitted with the chief complaints referable to their abscess. Of the remaining group, four came in for treatment of empyema secondary to the abscess, two for the removal of a foreign body, one had carcinoma of the larynx, and the remainder had various conditions such as pyemia, diabetic coma, actinomycosis, malignancy, and terminal conditions in which the lung abscess was frequently found only at autopsy. There were fourteen deaths in the group. Two died after attempts to drain a metastatic brain abscess; one died after drainage of an empyema and one died suddenly after the first stage of a thoracotomy. Eight of the ten other deaths occurred within two weeks after admission. It was felt that this type of case could not be grouped with the clinical cases of lung abscess.

The types of treatment and results were outlined. Four cases were treated as empyemas; one died of a brain abscess; two were cured except for a residual bronchiectasis, and one was still under treatment. Six patients were treated by bronchoscopy. Two had foreign bodies removed and improved greatly; two others were completely cured; one remained unchanged and refused surgical treatment; one was greatly improved but required surgical drainage later. Five cases came to surgical drainage. Of these five, one died suddenly on the second day after the preliminary stage without apparent cause. (This patient had a marked fibrosis of both lungs and a severe bronchitis at autopsy and it was felt that the diminution in vital capacity was contributory to her death.) One died some time after drainage and was proved to have carcinoma of the lung as the cause of the abscess. Two were cured, but one of these still had a fistula and one case was still under treatment but was progressing satisfactorily. There were 11 other cases which were not terminal cases and these had only medical management. Two of these died, each with a brain abscess; one was unimproved, and eight were improved. Of the eight discharged as improved, four were heard from subsequently and were symptomatically cured.

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*This patient was recently admitted and one of the sinuses curetted, but no evidence of a persistent lesion was found.

Pneumothorax had been used in one case. This was a patient having a central abscess draining into a bronchus and the pneumothorax was used to supplement bronchoscopic drainage.

Arsphenamine had not been used in any case.

A review of the end-results of various forms of treatment abstracted from the literature was next presented.

Medical management was shown to have a possibility of cure in 10 to 50 per cent of instances. This variation in statistics was thought to be due perhaps to the acuity of diagnosis. Cases diagnosed as pneumonia which went on to recovery reduced the incidence of cure of lung abscesses statistically. Under medical management were included bed rest, transfusions, postural drainage, high caloric diet, vitamins in the form of cod liver oil, orange juice and tomato juice, heliotherapy, and adequate nursing.

It was stated that arsphenamine was not generally recommended. In a paper presented before the American Association of Thoracic Surgery, five men who discussed the work definitely stated that they had failed to obtain results by this method.

Four hundred and forty-seven collected cases of bronchoscopic drainage were reviewed. The percentage of cures in this series ranged between 46 and 54 per cent. The central abscesses readily reached by the bronchoscope were particularly favorable; whereas the peripheral type often failed to respond to this treatment.

Hedblom's series of cases treated by thoracotomy were next presented. This author has had 114 personally operated cases with 66.6 per cent cures and 23.6 per cent mortality. In 714 cases collected by Hedblom, there were cures in 27 per cent and a mortality of 16.1 per cent. Many surgeons, whenever thoracotomy is indicated, feel that it should be done early (in the sixth to eighth week) because at this stage dense fibrosis about the abscess has not occurred and the cavity is relatively simply collapsed. The incidence of secondary bronchiectasis, moreover, is diminished by early operation. Some cases of chronic abscess require secondary operations to obliterate the cavity.

In closing, the following points were presented:

1. Intensive medical treatment is necessary and results in cures up to 50 per cent.
2. Bronchoscopy is of greatest value in central abscesses and yields about 50 per cent cures.
3. Surgical drainage when indicated should be done early. It is recommended for peripheral abscesses which do not respond to conservative measures within six to eight weeks. About 65 per cent cures are reported in the best series.

DISCUSSION

Dr. T. J. Kinsella stated that this is one field in which coöperative effort between the medical man, the roentgenologist, the bronchoscopist and the surgeon is very important. To treat a lung abscess medically for a long period of time, meanwhile overlooking the foreign body which caused the abscess, is certainly not serving the patient's best interests. To institute very radical surgical procedures for the treatment of a lung abscess resulting from a degenerating pulmonary carcinoma is likewise scarcely warranted. A fair number of centrally located abscesses will drain themselves spontaneously and go on to complete healing. Others in the same position during the subacute stage, and an occasional one during the chronic stage, may be successfully treated by bronchoscopic aspiration alone. The fundamental point here, as in the treatment of abscesses elsewhere, is adequate drainage. Prolonged suppuration predisposes to carnification of the lung with secondary bronchiectatic changes. Surgery should probably be avoided in the acute stage where medical supportive measures, postural drainage, and bronchoscopic aspiration should be utilized; however, if results are not obtained in eight to twelve weeks, surgical drainage should be instituted, particularly in the peripheral type of lesion.

Dr. Wangensteen said that in Dr. Koucky's series one patient with chronic abscess of the lung of a year's duration was treated successfully by bronchoscopic aspiration alone. One of the patients with gangrene referred to by Dr. Koucky in his report had an interesting history. The patient had been successfully treat by his family physician for a central lung abscess communicating with a bronchus, by pneumothorax. The patient improved rapidly and left the hospital. One day he became suddenly ill again, and it was found that the lung had re-expanded. He was admitted to the University Hospital with a foul bloody sputum and a diagnosis of gangrene of the lung was made. The patient did not survive for more than a few days. In some cases with pulmonary gangrene, Dr. Wangensteen said arsphenamine had been used with good results.

The role of bronchoscopy in the treatment of pulmonary suppuration, Dr. Wangensteen felt, could not be overemphasized and related the instance of a patient who had no sputum and in whom bronchoscopy had consequently not been employed early. It concerned a boy of 17 years who had pneumonia in June, 1931. Fever continued after convalescence and the patient spent the summer in Colorado under suspicion of having tuberculosis. In November he was sent back with a diagnosis of encapsulated empyema. The roentgen examination, as well as the physical findings, appeared to substantiate this condition. Aspiration was done and a serous type of fluid was obtained from which the streptococcus was isolated. A thoracotomy was done over the lower right chest, where the X-ray showed the density to be. The pleural cavity was free. Believing the collection to be interlobar and wishing to avoid contaminating the free pleural space, a pack was inserted over the parietal pleura and the skin was closed. A subsequent thoracotomy showed no exudate between the lobes of the lung. The fluid was negative for tuberculosis on guinea pig inoculation. Lipiodol filling of the lung showed an obstruction to the right lower bronchus. Bronchoscopy revealed the bronchus to be plugged with granulation tissue. After bronchoscopy the fever promptly remitted and the boy gained weight and has remained well. A subsequent lipiodol filling revealed bronchiectasis. Dr. Wangensteen believed that an unresolved pneumonia had been present here. The pathologists reported the removed tissue to be carcinoma, but changed their minds when informed of the patient's age. Metaplasia of the bronchial epithelium in infection, Dr. Wangensteen said, may occasionally be confused with carcinoma of the bronchus or lung.

Dr. J. R. Paine (by invitation) read a paper on Constant Suction by Nasal Catheter as an Adjunct in Postoperative Treatment.

Dr. Paine stated that the following material was part of some work which has been done during the past year at the University Hospital in an attempt to make postoperative convalescence more pleasant for the patients subjected to abdominal surgery. In particular it has been an attempt to control more adequately postoperative nausea, vomiting and distention, and to diminish the number of enemas which patients required.

The method used, Dr. Paine explained, was the application of a suction apparatus to a Levine nasal catheter, which was passed into the stomach through the nose. These catheters were inserted after operation at intervals varying from a few minutes to two days. The length of time suction was applied varied from one to fifteen days.

Over a period of three months, routine nasal suction was applied postoperatively to forty-eight cases classified as follows:

Herniotomies	7
Biliary cases	9
Appendectomies	10
Gastric cases	8
Intestinal cases	5
Miscellaneous	9
Total	48

Dr. Paine proceeded to give an analysis of the cases as follows:

Of the *hernias,* six were inguinal, one incisional. There were no mortalities. Ages varied from nineteen to fifty-seven. The average period of suction was two to two and one-half days. The suction was applied to the incisional hernia case for one day only. The average morphin dosage was ¼ grain for the whole period of suction. None of the patients had bowel movements. Two of the inguinal hernias required one enema each; one required three enemas. Of the six inguinal hernias, four had no distention, no nausea and no vomiting. One had marked distention when suction was applied, but this was relieved after a few hours. The patient had no nausea or vomiting. One patient had slight nausea and 100 c.c. of vomiting when the suction was first applied. Both the nausea and vomiting were relieved. There was no distention in this case. The patient operated for an incisional hernia had moderate nausea and distention when suction was first applied but both were relieved after a few hours. In this case there was no vomiting.

Of the *gallbladder* operations, six were cholecystectomies, two were explorations and drainage of the common duct, and one was a choleduodenostomy. There was one death in this group. A patient who had a drainage of the common duct died four weeks postoperatively. Ages ranged from twenty-five to fifty-four. The average period of suction for these cases was:

Cholecystectomics	2.5 days
Common duct cases	3 days
Choleduodenostomy	4 days

The average morphine dosage for each case was 1 to 1.5 grains. Following cholecystectomy one patient had one bowel movement. After exploration and drainage of the common duct the patient had one bowel movement. One patient, following choleduodenostomy had two bowel movements. Two of the six patients having cholecystectomy were given one enema each. The common duct cases were given three enemas; one case one, and the other, two. Three enemas were given in the case of the choleduodenostomy. There was no distention in any of the patients receiving cholecystectomies. All six were nauseated but four of the six were relieved of all their nausea a short time after suction was started and experienced no vomiting. The other two had a slight amount of vomiting. The common duct cases showed no distention. One had no nausea or vomiting. The other had slight nausea and an emesis of 225 c.c. during one out of six days that suction was maintained. The choleduodenostomy patient had slight distention, nausea, and vomiting.

Of the ten *appendectomies,* two were interval appendices and eight were acute appendices. There were no deaths. Ages ranged from sixteen to fifty-nine. The average period of suction was two days in the interval cases and three to three and one-half days in the acute cases. The average morphin dosage was 0.5 grain for the interval cases and 1 grain for the acute cases. Neither of the interval cases had any bowel movements. One of the acute cases had one bowel movement. Neither of the interval cases required enemas. Two of the acute cases required one enema each, and two required two enemas each.

Neither of the interval cases was distended. Both were nauseated slightly and one had an emesis of 300 c.c. Three of the acute cases had no distention, nausea, nor vomiting. Two were markedly distended when suction was applied but were quickly relieved and experienced no nausea or vomiting. One patient was not distended and had no vomiting but was slightly nauseated. Two patients were not distended but were slightly nauseated and had emesis of 50 c.c. and 150 c.c.

Of the eight *gastric* cases reported in this series, five were resections of the stomach and one was a simple gastroenterostomy. These six patients were operated on for either carcinoma of the stomach or benign peptic ulcer. The other two cases were perforated duodenal ulcers.

The mortality from perforated duodenal ulcers was 100 per cent. One of these patients was a sixty-three-year-old man who entered the hospital forty-eight hours after rupture of the ulcer and died forty-six days later from diffuse peritonitis. The other was a fifty-year-old man who died thirty days after closure of the perforation, of coronary thrombosis and erysipelas.

One case (gastroenterostomy) was a fifty-nine-year-old woman with cancer of the stomach who died 29 days after operation of cachexia and weakness. The death in the resection group occurred in a sixty-four-year-old man who died fourteen days postoperatively of pneumonia and a large gastrojejunal ulcer after resection of the stomach.

The ages in all the gastric cases varied from forty to sixty-three. The average period of suction was ten and one-half days for the ulcer cases and four days for the gastroenterostomy cases. The average morphin dosage was 1.5 grains for the ulcer and resection cases. No bowel movements occurred in any of the gastroenterostomy cases. Four bowel movements occurred in one ulcer case and seven in the other. Only three enemas were required in the whole group, one in each of the three gastroenterostomies.

No distention, nausea, or vomiting was present at any time in three of the gastroenterostomies. One patient was distended following gastroenterostomy but was promptly relieved by suction. This patient had no nausea or vomiting. The other two enterostomies were not distended but had moderate amounts of nausea and vomiting.

In the perforated ulcer cases no nausea, vomiting or distention occurred in the instance of the fifty-year-old man who developed erysipelas and died 30 days postoperatively. In the other patient who died 46 days after operation for an ulcer which had been ruptured 48 hours, there was a moderate amount of distention and nausea and vomiting late in the course. In this case suction was maintained for fifteen days immediately postoperatively and at irregular intervals later in the course of his illness. It was the feeling of the surgical staff that the suction controlled his distention fairly well and that it was one of the chief causes of his living as long as forty-six days.

The *intestinal group* of five cases composed a varied type of case, all of which required enterostomy to control distention and vomiting before the surgical staff began to use nasal suction. Diagnoses included were three closures of fecal fistulas, one intussusception, and one sigmoid resection. The average period of suction was three to four days. There were no deaths. The average morphin dosage was 2.5 grains. One out of three fistula patients had one bowel movement. The resection of the sigmoid one had two, and the intussusception four. The resection of the sigmoid required two enemas and one fecal fistula case required one.

Of the three patients with fecal fistulas none had any distention. One had no nausea or vomiting. One had marked nausea and vomiting when suction was begun, but was relieved. One had slight nausea and vomiting. The intussusception one had no distention. Moderate nausea and vomiting was relieved when suction was begun. The patient undergoing sigmoid resection had no distention, but was slightly nauseated and vomited a moderate amount.

The *miscellaneous* cases were of such a varied nature that time had not permit of a detailed analysis. In these cases suction was applied usually because the patient complained of nausea, vomiting, or distention. Out of eleven cases failure to relieve the symptoms was experienced in three.

Dr. Paine's conclusions after comparing the above cases with an equal number of similar cases treated in the same manner except for the suction were as follows:

1. Appendectomy and hernia patients probably did a little better, as far as nausea, vomiting and enemas were concerned, with nasal suction than without it, but probably not enough better to warrant subjecting the patient to retaining the nasal tube in his nose for several days and postponing his return to fluids and food by mouth.
2. Patients having operations on the biliary tract showed a distinct improvement in their postoperative convalescence when nasal suction was applied. Distention was practically done away with. The frequency of nausea and vomiting was decreased, and the number of enemas required was much less. Nasal suction for two to four days was advised as a routine postoperative measure.
3. Following gastric operations nasal suction was recommended as a routine procedure for the control of distention, nausea, and vomiting. These rarely occurred if suction was applied, and enemas could practically be done away with. In gastric operations it was Dr. Paine's observation that patients received more comfort from nasal suction than any other group of cases.
4. In operative procedures on the gastrointestinal tract, which usually called for an accompanying enterostomy at a slightly higher level, if nasal suction was applied immediately after operation the patients did satisfactorily without the enterostomy.
5. It was recommended that any postoperative distention with or without nausea and vomiting be taken as an indication for the use of nasal suction. Many patients went for many days without a bowel movement and without complaint when nasal suction was used postoperatively.

DISCUSSION

Dr. Wangensteen said that an inverted bottle was used so that the amount of gas escape could be measured. The amount of gas and fluid drainage after enterostomy for acute intestinal obstruction Dr. Wangensteen believed to be correlated more with the degree of the obstruction than with the level of the obstruction. The method had been used successfully at the University Hospital in decompressing patients with simple obstruction of the intestine. In nine of ten patients with acute mechanical obstruction without compromise of the blood supply, decompression had been effected successfully by nasal catheter suction syphonage without operation. Dr. Wangensteen stated that the method had its greatest worth in adhesive obstruction and showed a patient in whom a complete obstruction (adhesive) developed after operation for acute suppurative appendicitis and was successfully decompressed by suction alone without operation. Dr. Wangensteen stated that even when the decompression was slowly accomplished by suction, relief from pain was almost immediate after the institution of suction. Dr. Wangensteen felt that it was necessary, therefore, to check these patients with acute bowel obstruction, in which the method was used, frequently by X-ray examination to note whether decompression of the intestinal distention was progressing satisfactorily. The appearance of gas in the colon indicates that the continuity of the intestinal current has been re-established. The method should not be employed in simple obstruction of the left colon, Dr. Wangensteen stated, because the competent proximal ileocolic sphincter limits the distention to the colon. In such instances cecostomy or appendicostomy should be done at once. In all strangulation obstructions heralded by the presence of rebound tenderness as well as intestinal colic, Dr. Wangensteen said that immediate operation is to be advised.

Dr. Paine was asked what size catheter is used.

Dr. Paine said a No. 14 or No. 16 is used.

Dr. Paine was asked how long the catheter should be?

Dr. Paine replied that they are about four feet long.

Dr. Wangensteen said they had recently had one patient who had been operated upon in the upper abdomen three times previously, on whom the method was used postoperatively and who was in a position to judge the merits of the method. He said that he didn't know that one could be so comfortable after an operation on the stomach.

Dr. Louis Sperling (by invitation) read a paper on The Distention Feature in Simple Obstruction.

The consequences of simple obstruction, Dr. Sperling stated, can be directly attributed to the effect of distention. Recognizing this, our treatment of this type of ileus is directed first toward the relief of distention and then toward removal of the obstructing agent. In many cases, especially of the adhesive type, if the distention is relieved the obstruction will take care of itself.

Distention plays its most important rôle in low ileal and colonic obstructions. In high obstructions (pyloric) the course is much shorter; death is due to a disturbance in the mineral balance and there is not time enough for distention to develop.

What is the mechanism of the production of distention? Assuming that the obstruction is in the terminal ileum and complete in nature, this is the sequence of events as seen in the experimental animal. Stasis develops as the result of the obstruction. The bowel then endeavors to overcome this stasis by increasing its peristaltic rushes. Accompanying this increase of intestinal activity there is an outpouring of secretions into the intestinal lumen. In a very few hours gaseous distention of the bowel above the site of obstruction may be demonstrated by X-ray. This is due to stasis and has been shown by Dr. Wangensteen and others to be largely swallowed air. The increase of secretions and gaseous content of the bowel augments the intra-intestinal pressure, giving rise finally to distention.

The effect of distention on the function of the bowel is very important. Dr. Sperling in the experimental laboratory has confirmed the work of German investigators which showed that absorption in intestinal obstruction is always decreased and eventually nil. When it is considered that the amount of fluid excreted into the bowel in twenty-four hours (bile, pancreatic and intestinal juices) comprise a high percentage of the entire amount of fluid in the body, and that normally most of this is absorbed, while in obstruction there is a marked disturbance in absorption, it is at once evident why it is so important to give patients with intestinal obstruction subcutaneous and intravenous fluids and saline.

This disturbance in absorption can be demonstrated within the first twenty-four hours of simple obstruction and affects the absorption of gas as well as fluids. Under normal conditions much of the gas in the bowel is eliminated through the lungs after being absorbed into the blood stream, and only a relatively small quantity (10 per cent) escapes per rectum. In obstruction with decreased absorption there is, therefore, a progressive increase in the amount of gas in the bowel producing distention.

Dr. Sperling attempts to explain this disturbance of absorption by the increase of intra-enteric pressure with its effect on the circulation to the bowel.

What are the pressures which prevent absorption in the distended bowel, and are such pressures seen clinically in intestinal obstruction? In the experimental laboratory, Dr. Sperling has found that absorption is very limited when the intra-enteric pressure is maintained above 60 mm. Hg. In general it may be said that absorption from the intestine varies inversely as the intra-enteric pressure.

Kocher, in 1898, was the first to show that with increased intestinal pressure there resulted a decrease in the blood supply to the part affected. Von Zwalenberg, Gatch and others have shown that the blood supply is cut down correspondingly as the pressure is increased. Therefore, in distention, absorption is decreased, due to impairment of circulation brought about by increased intra-intestinal pressure.

The intra-enteric pressure in simple obstruction has been measured both clinically and experimentally. Stone and Firor found a pressure of over 150 cm. of water (equivalent to 115 mm. Hg.) in a case of low ileal obstruction of five hours' duration. Experimentally, the normal intra-intestinal pressure has been shown to vary between 1 and 4 cm. of water. In obstruction the sustained pressure is between 6 and 8 cm. of water, but during activity of the obstructed bowel the pressure may mount as high as 60 cm. of water or over 50 mm. of Hg. (Owings, MacIntosh, et al.). McIver has measured a pressure of 54 mm. of Hg. in closed loops. These pressures are not much below the pressures which Dr. Sperling has shown prevent absorption in the normal bowel.

It has been demonstrated experimentally by Raine and Perry that increasing the distention in obstructed rabbits by filling the gastro-intestinal tract with albolene hastens death. Decreasing the distention by means of enterostomy prolongs life. It has been shown by Drs. Wangensteen and Leven that by anastomosing the obstructed loop to the stomach (thus allowing the animal to vomit and so empty the loop), life is prolonged three times as long as compared in animals with only the simple obstruction.

By interfering with the normal blood supply, distention and increased enteric pressure sooner or later affect the viability of the bowel and, as has been claimed by several investigators, may result, in extreme cases, in gangrene of the wall. Experimentally, if a pressure of 60 mm. of Hg. is maintained in a loop of bowel for a period of time, there results a venous congestion. This may account for the rubor and discoloration often seen at operation. A congested appearance of the bowel has been noted in every case of experimental obstruction. Though actual necrosis has not been observed in this experimental laboratory, it has been reported by other workers.

The effect of distention on the viability of the intestinal wall is best illustrated in the large bowel when the obstruction is in the sigmoid colon. A closed loop is formed, due to the competency of the proximal ileocecal sphincter. The intra-intestinal pressure rapidly mounts, due to incoming gas and fluid which cannot escape. More gas is formed by fermentation and eventually the pressure is sufficient to cut off the blood supply to the intestinal wall with resulting gangrene and sometimes perforation of the cecum.

In summarizing, then, the sequence of events in the production of distention may be outlined as follows:

Obstruction
Stasis of fluids and gas
Hyperperistalsis and increased enteric secretion
Increase of intra-enteric pressure
Failure of absorption
More intra-enteric pressure
Distention.

Dr. C. H. Mead (by invitation) read a paper on Non-specific Mesenteric Lymphadenitis.

Dr. Mead opened his discussion of this condition by citing a case encountered upon the surgical service of the University Hospital in 1929.

The case was that of a male child, aged three, who had complained of abdominal pain for one week previous to admission to the hospital and had developed anorexia. He was seen by his family physician one day before admission to the hospital, and a temperature of 102° Fahrenheit was recorded, as well as tenderness in the right lower quadrant of the abdomen. His condition seemed to be becoming worse steadily. No nausea, emesis, diarrhea, or constipation had occurred. The past history was negative. Physical examination revealed a distended abdomen with questionable rigidity and tenderness in the right lower abdomen. No rebound tenderness was noted. No abdominal mass was palpated. Rectal examination was negative. All laboratory data and X-ray examination of the chest were negative. A diagnosis of subsiding acute appendicitis was made. Operation was performed and a normal appendix encountered. There were, however, numerous hard lymph nodes throughout the right aspect of the mesentery. One group was so large that it felt like a lobulated kidney. They were apparently inflammatory in character, and most of them were located along the intestinal border of the mesentery. No biopsy was performed. An operative diagnosis of acute adenitis of the mesenteric nodes of unknown origin was made. The patient's immediate convalescence was essentially uneventful.

Dr. Mead then discussed this peculiar abdominal condition and stated that it had been described clinically as "strumous" abdomen early in the 19th century, but that its presence during life was usually a diagnostic conjecture. The condition was considered to be very uncommon and was regarded as a pathological curiosity as recently as 1905. All necropsy findings during this early period indicated that the condition was tuberculous in origin. In the early 20th century the condition began to attract surgical attention, as enlarged mesenteric lymph nodes were quite frequently encountered as the only apparent etiological factor in the production of acute abdominal symptomatology. The nodes described were usually necrotic, caseous or calcified in appearance and all of them were considered to be tuberculous in origin. About ten years ago, however, attention was directed to a similar condition of enlargement of these nodes in which the gross picture, pathologic and bacteriologic studies failed to show evidence of tuberculosis, but often showed lymphoid hyperplasia and pyogenic organism. Consequently a moderate literature has grown up about this condition as an entity, separate from the tuberculous mesenteric lymphadenitis.

Dr. Mead then presented a lantern slide showing a tabulated comparison of the two conditions, tuberculous and non-specific mesenteric lymphadenitis, comparing the frequency of occurrence, age incidence, symptomatology, physical findings, laboratory data, treatment, complications, etiological factors, sources of infection, pathology, and pathological anatomy. He then presented a lantern slide illustrating the normal lymphatic drainage of the small intestine and the location of the lymph nodes in this region. Further slides were shown illustrating the appearance of the enlarged non-specific lymph nodes when encountered in the mesentry, and the appearance of the nodes when encountered in a later and calcified condition.

Reference was then made to the case which had been cited, in which Dr. Mead stated that recent follow-up examinations of the child showed a 3 plus Mantoux test, and X-ray findings of calcified mesenteric lymph nodes. He believed that this case, which at first appeared to be a non-specific adenitis, now seemed to be one of tuberculous adenitis, and that it was illustrative of the fallacy of premature generalizations.

Dr. Mead stated that the occurrence of so-called non-specific mesenteric lymphadenitis had raised a question as to the normal size of the lymph nodes of the mesentery at different age periods, as any statement regarding enlarged nodes was inadequate without some standard, or normal, for comparison. Consequently, an investigation is under way at the present time to determine the normal sizes of such lymph nodes. Material is difficult to collect, a total of fifty-two satisfactory cases having been obtained to date. Analysis of twenty of the cases has been completed to date, with individual dissections and weight determinations for each node in the mesentery, the total number of nodes so treated numbering 2,582. Preliminary statistical examination of this data tends to show that the size of the nodes increases until twelve years of age, thus following quite closely the general growth curve of lymphoid tissue.

Dr. Mead concluded that mesenteric lymphadenitis of an acute nature could not usually be differentiated clinically from the findings of acute appendicitis; that non-specific mesenteric lymphadenitis was probably a stage of tuberculous adenitis; that research regarding the normal size of these nodes at different age periods tended to show a growth curve following that of lymphoid tissue elsewhere in the body.

Dr. Owen H. Wangensteen read a paper on A New Operation for the Repair of Inoperable or Recurrent Inguinal Hernias.

Dr. Wangensteen stated that somewhat more than a year ago he had operated upon a young woman with a desmoid tumor in the lower portion of the left abdomen. It was found at operation to arise in the internal oblique muscle and the transversalis fascia and had a slight attachment to the external sheath of the rectus. Its removal necessitated sacrifice of the entire lower portion of the internal oblique muscle with a part of the transversus abdominus muscle together with the entire transversalis fascia in the groin, as well as the lateral border of the rectus sheath. It was apparent that no local sliding of tissue would suffice to close the defect. In casting about for a method by which the defect might be repaired, Dr. Wangensteen stated he hit upon the plan of swinging a flap of fascia lata up from the thigh. The procedure worked so satisfactorily that Dr. Wangstensteen said he had adapted it to the repair of recurrent or inoperable hernias in the groin.

Including the patient with the desmoid tumor, seven cases had been operated upon in this manner, all of which have been successful. One of these was a man of fifty-seven years operated upon three times previously for direct inguinal hernia by three diferent experienced surgeons. At the time of examination there was a distinct bulge in the groin, no trace of the inguinal ligament being found in the lower half of its normal course. In effect both a direct inguinal and a femoral hernia were therefore present in this case.

The technic of this procedure was illustrated by a few lantern slides. Dr. Wangensteen said he made a slightly curved incision on the antero-lateral aspect of the thigh of the same side, the convexity of the incision being directed medially. The incision is begun about three inches below the anterior superior spine and extends downward somewhat past the midportion of the thigh. The adjacent skin margins are somewhat undercut and a vertical incision is made through the fascia lata just lateral to the sartorius muscle extending the entire length of the skin incision. At the lower angle of the wound, a fascial flap is raised by cutting the fascia lata transversely in a posterior direction for about 4 inches. A vertical incision extending upward is then made at the posterior margin of the flap. In this manner a generous piece of fascia with the tensor fascia lata muscle incorporated within it above is raised up. The inferior surface of this fascial flap is smooth; its attachment to the intermuscular septum between the vastus lateralis and the rectus femoris muscle is cut, as the flap is mobilized. Its superior aspect is covered with fat. The tensor fascia lata muscle at the base of this flap has its own nerve and blood supply, *viz.,* branches of the superior gluteal nerve and artery.

In the repair of the defect persisting after excision of the desmoid, Dr. Wangensteen stated that he had pulled this fascial flap beneath Poupart's ligament with its fatty surface beneath in contact with the parietal peritoneum. In the repair of hernias, however, he had found it most convenient in utilizing the conjoined tendon and the arched fibers of the internal oblique to pull this fascial flap over Poupart's ligament, the superior surface of the flap remaining upward.

The general conduct of the operative procedure Dr. Wangensteen outlined as follows:

The inguinal incision is made first and the initial portion of the hernioplasty done, *viz.,* suture of the arched fibers of the internal oblique and the conjoined tendon to Poupart's ligament by interrupted mattress sutures of chromic catgut passed from the outer aspect of the inguinal ligament. The outer leaf of the external oblique aponeurosis is then attached to the superior aspect of the conjoined tendon and the arched fibers of the internal oblique by a few interrupted sutures. The fascial flap from the thigh is then designed and swung into the inguinal wound directly over Poupart's ligament by tunneling beneath the skin and subcutaneous fat for the transit of the flap. The inner leaf of the external oblique aponeurosis is pulled medially with retractors and the flap is sutured to the external border of the rectus sheath medially, the pubic tubercle below and attached to the internal oblique and external flap of the external oblique aponeurosis above. The inner leaf of the external oblique is then sutured over the fascial flap, just enough fat being removed from the superior aspect of the flap to permit of satisfactory fascial approximation at the site of suture.

The nature of the support lent to the weakened tissues of the groin in direct inguinal hernias by this method of repair, Dr. Wangensteen stated, is easily demonstrated by having the patient cough (operation under spinal anesthesia) before and after the transfer of the flap. The skin and subcutaneous fat of the thigh wound are sutured and no disability has been experienced by the patients because of failure to close the fascial defect. Muscle hernia does not ensue. A slight fullness persists just beneath the anterior superior spine, necessitated by slight rotation of the flap in swinging it upward.

Dr. Wangensteen felt that the firm substance of this pedicled flap with its own blood and nerve supply preserved, presented distinct advantages over the use of the free fascial strips incorporated in the hernioplastic repair, and believed that large recurrent hernias in the groin, not amenable to repair by other methods, could be satisfactorily mended by this fascial transfer.

DISCUSSION

Dr. Wangensteen was asked whether it was his practise to remove the testis.

Dr. Wangensteen stated it had not been removed in any case except the last one, that of an old man in which a hematoma, developed postoperatively, became infected and the testis was excised. The hematoma had come from a thick wall hydrocele dealt with at operation.

Dr. Wangensteen was asked if the smooth side of the fascia was turned down in this case.

Dr. Wangensteen replied it was, and stated that this maneuver required slight rotation of the flap which caused some fullness to persist just below the anterior superior spine. One just closed the skin and subcutaneous fat in the thigh wound and no difficulty was experienced by the patients because of the fascial defect.

Dr. Green expressed the appreciation of the members of the Surgical Society for the excellent program which had been presented by the Surgical Staff of the Hospital.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The following were among the subjects considered at the annual meeting: The Council instructed the committee in charge of that part of the Intern's Handbook which concerns the Council, to proceed with the preparation of the text for early publication. It was decided that in general the products listed in the chapter on Medicinal Foods in New and Non-official Remedies be transferred to the Committee on Foods. It was decided to hold iodized table salt suitable for use by the public on its own initiative on condition that it is made to contain a safe proportion of iodine and that iodized salt with a higher percentage of iodine be considered to have the status of a drug. It was decided that although claims for Vitamin A as an aid to the establishment of general resistance to infection might be recognized, the evidence does not permit claims for "anti-infective" value in specific conditions. The Council decided that corn plasters and corn cures containing salicylic acid must be held to be therapeutic agents and that their indiscriminate use is not safe. The Council decided to revise the description of Antivenin (Nearctic Crotalidæ) in accord with the work of Jackson. It was decided to continue the policy of considering each liver extract individually, so that each manufacturer might be given opportunity to present evidence for the safety of the intravenous administration of his product. It was decided that an investigation of the present status of bacillus acidophilus therapy be carried out. The Council decided to ask the Bureau of Investigation to give further publicity to the hazards from the use of cinchophen. It was decided to revise the New and Non-official Remedies article "Sulpharsphenamine" to emphasize the dangers and limitations of sulpharsphenamine therapy. (Jour. A. M. A., April 16, 1932, p. 1374.)

THE INTERNATIONAL TREATY CONTROLLING NARCOTIC DRUGS

On March 31 the United States Senate ratified the international treaty for limiting the manufacture of narcotic drugs. The treaty was the result of an international conference held at Geneva in 1931. The treaty should be far reaching in its effect on preventing the smuggling of contraband drugs into this and other countries. The treaty does not weaken or relax existing American measures for the control of the legal use of these drugs, or those for the suppression of their abuses. The treaty deals with two phases: the limitation of the manufacture of narcotic drugs, and the strengthening of measures for their international control and distribution. (Jour. A. M. A., April 16, 1932, p. 1379.)

PROGRESS SECTION

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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EYE, EAR, NOSE AND THROAT

OTOSCLEROSIS. A CLINICAL ANALYSIS: Dan McKenzie, London (Jour. of Otol. and Laryng., Feb., 1932). The term "otosclerosis" is defended. As applied, the word connotes a symptom group that can be evoked by quite a number of different pathological causes inducing one particular physiological change in the ear. It is a diagnosis that is being more frequently made. Osteoporosis of the labyrinthine capsule occurs frequently without any indication of middle ear inflammation, past or present. Fraser has shown that the same bone changes are also frequently associated with an otitis media, and also that the otosclerosis syndrome may be evoked by scar tissue in the middle ear without any osteoporosis.

The author classifies 622 cases seen in his own practice into three groups. The "primary" group numbers 411 cases. In these there was no history or evidence of otitis media in any form. A "secondary" group of 129 cases included those cases in which the hearing defect was associated with and probably induced by some form of an otitis media. The third clinical division contains the "incipient" cases; in these, suppuration and catarrh being absent, the deafness is trifling though of long standing and uninfluenced by treatment. Of the 622 cases, 82 come under this group.

The author anticipates objections which will arise to such a classification. He defends it by offering a detailed analysis of the clinical findings in each group. A comparison of the various characteristics of one group (age, incidence of onset, sex ratio, results of hearing tests, etc.) with those of each of the other two groups, indicates that there is some basis for this classification.

Lawrence R. Boies, M.D.

A PLEA FOR THE "WINDOW" RESECTION METHOD IN DEALING WITH CERTAIN TYPES OF LARYNGEAL CARCINOMA, WITH A CLINICAL HISTORY OF SEVEN CASES: Norman Patterson, London (Jour. of Otol. and Laryng., Feb., 1932). Seven cases of malignant laryngeal growth too extensive for thyrofissure were operated by resection of a large window made in the thyroid cartilage. In these cases the growth involved the anterior portion of a cord or both cords and in some instances extended into the subglottic area. The advantages of the operation lie in less mutilation, and the fact that the outlook as to voice and respiration may be as good as after laryngofissure.

The cases:

1. Well 9 years after a window resection in 1922. A laryngofissure had been performed in 1918. The growth had involved the anterior third of the right cord without fixing it. There was recurrence at the site of original removal.
2. This patient had a growth involving the anterior half of the left cord with involvement of the commissure and extension onto the right cord. A lung abscess developed post-operatively and the patient succumbed. At postmortem it was found that the tracheal glands were involved by tumor metastasis.
3. Well 5 years. Voice rough but strong. At the operation, in addition to the window resection, a portion of the cricothyroid membrane and the cricoid cartilage was removed. The growth involved the commissure and anterior portion of both cords and extended into the subglottic area. No tube is worn.
4. The malignancy in this case involved the anterior half of the left cord and extended onto the right cord. There was no fixation, but the tumor extended into the subglottic area. At operation the central portion of the cricothyroid membrane was removed in addition, to the window resection. The voice was fair and tracheotomy tube could be dispensed with. The patient died 18 months after operation of a cerebral hemorrhage.
5. At operation, practically all of the left cord was found to be involved, with exception of the posterior end. It was fixed. The whole of the cord and part of the arytenoid was removed and also a portion of the cricothyroid membrane. The patient died of heart failure 3 years and 8 months later.
6. There was involvement of the anterior two-thirds of the left cord to the commissure and extension into the sub-glottic area. The whole of the left cord, the anterior half of the right cord and a portion of the cricoid ring was removed. The voice is fair though rough. No tube required. The patient is well without recurrence 4 years after the operation.
7. The author suggests there is little doubt that this case was not suitable for any procedure except laryngectomy. A large irregular mass involved the anterior two-thirds of the left vocal cord extending into the subglottic area. The patient had been operated on two years previously for a carcinoma of the tongue. Following an extensive window resection, the patient made a good recovery from the operation but could not dispense with his tube. There was recurrence, to which he succumbed 6 months later.

Lawrence R. Boies, M.D.

SURGERY

THE TREATMENT OF FISTULA-IN-ANO BY THE WHITEHEAD TECHNIC. Taken from "Der Chirurg," Volume IV, Number 3, February 1, 1931, Page 97. By Dr. M. Siebner, Stuttgart. This operation consists essentially in the resection of the lower end of the rectum, including the rectal end of the fistula, according to the well-known Whitehead technic for hemorrhoids. Because of the usual location of the external opening, the sphincter does not have any control. The treatment of the intra-sphincteric fistula does not offer the difficulties of cure by minor methods that one experiences in the extra-sphincteric fistula, and it is this latter type which requires often repeated operations, and it is for this latter type that the Whitehead technic is being used by the author. One of the essentials is the preservation of the sphincteric ring. The function of the internal sphincter is more definite than the external sphincter when the external sphincteric action is retained. If the external sphincter is completely divided, the tonus of the autonomic action of the sympathetic and parasympathetic, which supplies the internal sphincter, is lowered and incontinence results.

The usual method of complete excision of old fistulæ with the plastic skin and fat flaps often successfully closes these abnormal openings, provided the internal sphincter has not been functionally disturbed. Because of the extensive scar contraction, recurrences often take place, requiring repeated operations. Thus it occurs, in healing, that the new external opening is usually nearer to the anal margin, as well as in the rectum, and frequently more than one opening exists on the inside. The lowered vitality of the lower rectal mucous membrane justifies the complete excision and the sliding down of healthy mucous membrane to meet healthy skin. Usually the internal openings are quite low down, frequently in the region of the internal sphincter, and thus within a few centimeters of the anal ring. Should the internal opening be exceedingly high, it is wise to use the usual external excision technic without disturbing the external sphincter. If recurrences occur, as above noted, the opening will be much nearer the anal ring, and thus lends itself to the Whitehead technic about to be described.

The technic of this operation is very much like the Whitehead operation for hemorrhoids. First, a careful dilatation of the sphincter is made, and then an incision, surrounding the anal opening at the mucocutaneous junction. The rectal mucous membrane is carefully released from the underlying sphincter until the distance to one to two cm. above the uppermost internal fistulous opening is reached. Immediately surrounding the fistulous opening, inflammatory thickening makes the peeling-off process somewhat tricky, and care must be used to prevent tearing the mucous membrane. The cuff of mucosa and submucosa is then resected, and skin and mucous membrane united similar to the method in the Whitehead hemorrhoid technic. When once the region beyond the sphincter is attained, the whole thickness of the rectum may be included in the excision. If general anesthesia is used, local anesthesia with super-adrenalin is also used to simplify the dilatation, as well as to relax the tissues locally and make them more anemic. The external fistulous opening is either curetted or excised, and, if necessary, a skin fat flap inserted, similar to the usual method.

The author cites several illustrative cases, and recommends this method as especially indicated in cases of recurrence of fistula situated external to the sphincters.

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ROENTGENOLOGY

THE CAVITY IN PULMONARY TUBERCULOSIS: I. (Roentgenologic and Anatomic Study)—Max Pinner, M.D. II. (Genesis and Further Developments)—Max Pinner and Marion E. Parker, M.D. (Amer. Jour. Roentg. and Rad. Ther., Vol. XX, p. 518-526, 1928, and Vol. XXV, p. 455-463, 1931).

Pinner has correlated X-ray and autopsy findings of the tuberculous cavities and feels that they form a splendid aid in prognosis and in determining the type of therapy.

He recognizes the occasional healing of cavities spontaneously but says that "all statistical presentations on this topic proved a relative brief average survival period of cavity bearers, and the rarity of closure of cavities without surgical intervention." The majority of cavities are prevented from closing by: (1) Fibrous walls, (2) eccentric tension, (3) stiffness of pleura and mediastinum.

He feels as Ranke does, that at a certain stage of the disease phthisis is a strictly localized destructive process in an otherwise little affected body and warns us that the well nourished non-toxic patient (compensated phthisis) so commonly seen does not necessarily mean a cure in either a clinical or anatomical sense.

The majority of cavities can be classified into one of three types as follows:

TYPE I.—MOTHEATEN AREAS IN INFILTRATION

Anatomy—This is represented by a loss of tissue in an area of tuberculous pneumonia, or heavy infiltration. There is really no wall to the cavity. *X-ray*—Appears as dense infiltration with localized areas of rarefaction usually about the size of a cherry pit. If a large area is involved, there is narrowing of the lung field and the mediastinum is pulled over. *Course*—Small cavities may coalesce and form large cavities (whole lobe). Lesions may clear quite rapidly, but with a large cavity, healing is hopeless even with surgery (including pneumothorax).

TYPE II.—ROUND OR OVAL CAVITIES

Anatomy—The result of a small exudative lesion. The size and shape are due to eccentric tension and fibrosis. The wall is usually a thin layer of fibrosis, sometimes surrounded by infiltration. *X-ray*—The cavities are smooth in outline, usually round and oval. The size varies from 1 to 10 cm. (seldom larger). The density of the ring surrounding the cavity appears either as (1) barely visible, (2) stringy, (3) moderately dense. *Course*—They enlarge or decrease in size very abruptly, or the walls may become greatly thickened, in which case the cavity is transformed into Type III.

TYPE III.—FIBROID, IRREGULAR CAVITIES

Anatomy—Marked pleural thickening, heavy irregular walls, often trabeculations. *X-ray*—Thickened pleura with an area of excavation underlying. *Course*—Pathogenesis is not well understood, probably slow and chronic. These cavities seldom heal spontaneously.

It is felt that it is more important to describe the type of wall surrounding the cavity than it is to describe its location and its size (within limits). Interesting figures are quoted to show the frequency with which closure is brought about by pneumothorax and phrenic nerve operations in Types I and II, and the great difficulty of closure by these same methods in Type III.

F. L. Jennings, M.D.

CORRESPONDENCE

DOCTORS AND HARD TIMES

To the Editor:

In December, 1896, as editor of *Northwestern Lancet*, I wrote an editorial that fits so closely conditions today that I think it may be of interest to reproduce parts of it; moreover there may be some encouragement to the despondent in finding that although the slump in the practice of medicine as well as in general business was at least as great thirty-five years ago as it is today, recovery was complete and there have been many prosperous years since.

To quote from the editorial: "That the general depression of business during the past three years should have been attended with a considerable falling off in the practice of the specialist is not to be wondered at, since much of the work done by those who limit their practice is upon chronic affections, which, when first brought under treatment, have in many cases existed in about the same state for a long period of time, and might still be endured for some time longer did the necessity for economy forbid running up a bill for treatment. . . . But what is not so easy to understand is why the business of the general practitioner has fallen off at the same time with and almost to the same degree as that of the specialist. For the general practitioner depends but little upon chronic cases for his practice; his calls are for the most part on account of acute attacks for which a physician must be summoned whether or no without counting the cost. The services of the obstetrician must be had just the same in good times as in bad, and accidents will happen without regard to the ability of the individual to pay the doctor's bill. Indeed, as it is an ill wind that blows no one good, it might be expected that the general practitioner would reap some benefit from the scarcity of money, by having cases come to him for treatment that in better times would incur the larger expense of employing the services of a specialist. In the face of all these reasons to the contrary, the cry arises from all sides that not only the income but the business of the general practitioner has been materially lessened since the panic of 1893."

The editorial then goes on to discuss the various explanations offered by the *Medical Record* and other medical journals to account for the condition just described. These explanations and discussions need not be repeated here, since it is but too apparent that they furnished no remedy that has acted as a preventive; witness conditions today.

Those were bad times indeed in 1893. In addition to the general stagnation of business and the unemployment we see today, the banks generally stopped paying out cash, not only specie but paper money as well. No matter what a depositor's balance was, he could not get cash for his check, unless he could show that an emergency existed like the call to make an unavoidable journey. Technically perhaps a bank that refused to allow a depositor to withdraw his funds could be forced to go into the hands of a receiver, but almost everybody was reasonable enough to accept the situation and not take steps that would have aggravated matters. So for a time all payments were made by checks and but little cash circulated. One member of our profession, now long since gone to his reward, was an exception, and demanded his money of the bank under threat of a receivership; to avoid trouble the bank paid him his balance, some six thousand dollars, but paid it in silver, nearly four hundred pounds in weight, and the doctor was obliged to employ a dray to carry it away.

So take courage, colleagues. This is not the first nor the worst slump in affairs that ever happened, and it will not be the last.

William Davis, M.D.

St. Paul, May 5, 1932.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

HUMAN STERILIZATION. J. H. Landman, Ph.D., J.D., J.S.D., of the College of the City of New York. 341 pages. Price, $4.00, cloth. New York: The MacMillan Company, 1932.

PRACTICAL TREATMENT OF SKIN DISEASES. Eduard Ahlswede, M.D., formerly Assistant Physician, University Skin Department, Eppendorf Hospital, Hamburg, etc. 798 pages. Illus. Price, $12.00, cloth. New York: Paul B. Hoeber, Inc., 1932.

DISEASES OF THE CORONARY ARTERIES. Don C. Sutton, M.D., Assistant Prof. Med., Northwestern University, and Harold Lueth, M.D., formerly Instructor of Physiology, Northwestern University. Price, $5.00, cloth. Saint Louis: C. V. Mosby Co., 1932.

SODOMY'S BEST LIBERATOR. Marcus Rosenberg. 16 pages. Price, paper cover, 75c. Bronx, N. Y.: Marcus Rosenberg, 1932.

SURGERY, WITH SPECIAL REFERENCE TO PODIATRY. Edward Adams, M.D., Professor of Surgery, First Institute of Podiatry, New York. 480 pages. Price, cloth ?. New York: International Journal of Surgery, 1932.

BODY MECHANICS. White House Conference on Child Health and Protection. $1.50. Century Company, 1932.

The present status of the study of postural changes (body mechanics) and the attention given to them by medical and educational authorities was surveyed. In this study, 75 per cent of the youth of the United States are said to have imperfect posture, which is frequently associated with functional scoliosis and with pronation of the feet. The relation of proper body mechanics to general physical well-being seems to be definite.

The description of a large-scale study on a number of school children is given. A considerable number of exercises devoted to improper posture are detailed.

THOMAS MYERS, M.D.

HEALTH PROTECTION FOR THE SCHOOL CHILD. White House Conference on Child Health and Protection. $2.50. Century Company, 1931.

This is a study of pre-school children, of whom 146,000 lived in cities and 37,000 in rural districts. An effort was made to determine to what extent they had been given physical examinations, dental examinations and immunization against smallpox and diphtheria. While the survey is necessarily inadequate in view of the comparatively small number of children studied, it reveals, nevertheless, to how small a degree these health measures have been applied to children of preschool age among families of all economic levels.

It would appear that preventive medicine among preschool children is only in its infancy and that the more thorough attention given to infants and to school children loses much of its value in view of the lack of preventive care between the ages of two and five.

THOMAS MYERS, M.D.

PSYCHOLOGY AND PSYCHIATRY IN PEDIATRICS: THE PROBLEM. White House Conference on Child Health and Protection. $1.50. Century Company, 1932.

This is not a text on the subject, but rather a consideration of the relation of behavior problems in childhood to the physician and educator.

The necessity for clinics operated by physicians trained in both pediatrics and child psychology, and manned by child psychologists, is emphasized as often the best means of dealing with behavior disturbances. If the general practitioner and pediatrician acquire psychiatric intelligence they can render effective service which frequently renders formal organizations unnecessary. The need for accurately correlating pediatrics and psychiatry in approaching these problems is described. The organic structure of the behavior clinic is discussed.

THOMAS MYERS, M.D.

THE PRINCIPAL NERVOUS PATHWAYS. Andrew Theodore Rasmussen, Ph.D. (Professor of Neurology, Department of Anatomy, University of Minnesota, Medical School). 73 pages. Price $2.50 New York: The Macmillan Company, 1932.

On the title page one finds these words, "The Principal Nervous Pathways—Neurological Charts and Schemas with Explanatory Notes." This statement describes, in brief, the contents of this book, but in no way indicates its value. Here is a monograph most excellently and ingeniously arranged, giving a splendid elucidation of a most difficult subject.

While intended, primarily, for the use of students, it will obviously be of immeasurable value to practicing physicians as well, and should be of interest to men in every specialty.

As Herrick has said, "It is priceless."

WALTER P. GARDNER.

MEDICINE IN VIRGINIA IN THE EIGHTEENTH CENTURY: Wyndham B. Blanton, M.D., Richmond, Garrett and Massie, Inc., 1931.

This is the second volume of the History of Medicine in Virginia, prepared by a committee of the Medical Society of Virginia, of which Doctor Blanton is chairman. Several state histories of medicine have appeared in recent years, sponsored by their respective state medical societies, and we believe other state associations, including our own, have histories in process of preparation.

It is a great pleasure to own and read this book, and in the opinion of the reviewer it sets a standard for state medical histories that up to the present has not been approached, either in exhaustiveness of research or in literary qualities. We are also of the opinion that future authors of state histories of medicine will have difficulty in equalling it. Settlement of our western states is so recent (our own goes back but eighty years), compared to that of Virginia, that we have not the background to make our histories of interest, perhaps, to other than local residents. This volume will, however, appeal to any historically-minded physician and student of social conditions, regardless of place of residence. Apparently the compilers examined all sources of information possible and the text of 420 pages is supplemented with six pages of bibliography which bears this out. An adequate index is also furnished. In addition, the typography and make-up of the volume is well done and pleasing to the eye. Space forbids our making a summary of the chapters and contents.

We wish to congratulate the Medical Society of Virginia. Fortunate, indeed, was the choice of Doctor Blanton, of the committee in charge, and of the publishers who produced this volume.

J. M. Armstrong, M. D.

THE STORY OF MEDICINE. Victor Robinson, M.D. Published by Albert and Charles Boni, N. Y. 1931. Price: $5.00.

As the title suggests, this history of medicine is written in a rather popular way; this fact makes it an easy source of education in the field of medical history, not only for the physician and the medical student, but also for the interested layman.

The "Story of Medicine" could hardly have found an author better fitted for such a work. Dr. Robinson, whose writings in the medico-historical field are very popular on account of their splendid style, has done his best in this work. The book comprises the entire history of medicine, starting with prehistoric times and ending with the beginning of the 20th century. The last chapter—outside of the chronological order—gives a summary of American medicine.

An appendix of twenty-one pages containing bibliographical notes arranged according to the chapters and within the chapters according to the material is most welcome to the student of medical history who desires to read up in greater detail the one or other phase of medicine. Every chapter is worked out with the same care and with the same interest. The author lays particular stress on painting the historical, social and scientific background for each chapter and its different phases. This he has accomplished in a masterly way; even if he occasionally seems to spend too much space on this "background" it is never tiresome, thanks to the lively description and style, gems of which may be found on almost every page. The characterizations of personalities are concise and very well done. The author has a certain gift of dealing with a situation or a person to bring out the salient points in a few well chosen words.

Only few omissions—they may have been intentional—can be found in this otherwise complete history. Nothing is mentioned of ancient Syrian, Jewish or Chinese medicine, and men like Oribasius, Aëtius and Paulus Ægìnita deserve a little more than to be mentioned in passing. Ketham Fasciculus medicinæ does not appear in the text, although almost half a page is devoted to its biographical notes; Eustachius and others are not mentioned. We must admit, however, that this is not supposed to be a reference book.

There are plenty of quotations from medical masters of all times and Dr. Robinson is to be congratulated for his fine judgment in the choice of them. The amount of chronological data is sufficient to be satisfactory and yet small enough so as not to tire the reader. There are no illustrations—probably in order to keep the price within the means of the average man—with the exception of the jacket, which has a reproduction of the centerpiece of an ancient Greek bowl, showing a scene from Homer's Iliad: Achilles bandaging Parroclus.

Robinson has done what he promised in the title; he has really placed before us the entire history of our profession, with all the epoch-making inventions and discoveries, all the different systems that either accelerated or retarded the progress of medicine, and all the follies that fill many a dark page in this "story." Between the lines one can read the delight the author experienced when writing this work, not dead history, but a live "story of medicine."

R. Rosenthal, M.D.

THE WAY OF HEALTH INSURANCE. A. M. Simons, member of the Research Staff of the Committee on the Study of Dental Practice of the American Dental Association; and Nathan Sinai, D.P.H., Associate Professor of Public Health, University of Michigan, and adviser to the Committee on the Study of Dental Practice. 216 pages, cloth bound, $2.00. University of Chicago Press: April 19, 1932.

After two years' investigation of eight leading European system of compulsory health insurance, Mr. Simons and Dr. Sinai present their report in the book, "The Way of Health Insurance," recently published by the University of Chicago Press. It will serve as a warning to the physicians and dentists of this country that if they do not take a hand in formulating the policies of any insurance system that may be installed in the United States, the professions will find themselves in conflict with its practices when it is too late. The authors cite the case in France, when after the insurance law had passed in the Chamber of Deputies, the physicians and dentists united, tardily, in an attack on it, held up its enforcement for two years, and virtually rewrote it.

The conflict between the professions and the laws, the authors point out, is due to the fact that health insurance always has been, and probably always will be, more "poverty" insurance, or "poor relief," than medical relief. It has its origin in a social need. Its cash benefits are a fundamental part of the system, and take the place of the pay envelope when sickness interrupts earning power. Social workers are largely responsible for the agitation for health insurance and for the formulation of its regulations. Politics also plays an important part. The authors state that the German system, which was the first, was originated by Bismarck in 1883 as a political move to get the support of the Social Democrats. Politicians under any government consider health insurance a palliative for social revolt. The pressure for social insurance becomes acute in times of depression, and history shows that attempts at legislative relief always follow economic depressions. This was true in Europe. It is true in America today. Economists say that 20 to 30 per cent of the sick do not at present receive adequate medical care. Health insurance bills are now before the legislatures of several states.

Another group that takes an active hand in formulating health insurance laws is the commercial insurance companies. This is natural, as they have the organization for the conduct of the business, and experience. In suggesting the error of allowing health insurance laws and regulations to be formulated by social workers, politicians, and commercial insurance companies, the authors make no reflection upon the sincerity or integrity of these agencies, but merely point out that since they know little of medicine and professional practice, only a minor consideration is given to these phases which affect the practitioner and the patient so vitally.

Their most detailed investigation was of the systems in Great Britain, Germany, and France, but a great deal of specific information is given about the systems of Denmark, Sweden, Norway, Austria, Belgium, Hungary, Switzerland, and other countries.

Germany has 44,000,000 insured, according to their statistics. Eighty-five per cent of all physicians give part or full time to insurance practice; a small group has a wealthy, non-insured practice; the rest starve, or practically so, especially the recent graduate, who usually has to wait five to seven years to get into insurance practice. The insured get both medical and dental service free, and cash benefits.

Great Britain has about 16,000,000 insured (the families of the insured are not covered as they are in Germany). Any registered physician or dentist can require the insurance committee to put his name on the "panel" list, from which the insured makes his choice. This panel list is posted in a public place. The British system differs from the German in the further respect that specialist services are not included, and medical service is, as far as praticable, divorced from the social management that determines whether cash benefits shall be paid. The authors are decidedly of the opinion that separation of the medical service from the administration of cash benefits results in a more efficient and honest operation of the system.

In France—the system which the physicians and dentists practically rewrote after a two-year fight—the relation between practitioner and patient is virtually the same as in private practice. The patient has free choice of practitioner, the practitioner fixes his own fee, and the insured presents the practitioner's bill to the insurance organization and is reimbursed with a percentage of it—usually 80 per cent.

Broadly viewing insurance in action in numerous countries, the authors make three important points: First, notwithstanding the many faults and deficiencies of the various systems, no country that has ever tried compulsory health insurance would be willing to go back to pre-insurance days; second, insurance practice is generally conceded to have increased the average professional income; third, it has not apparently improved public health, nor diminished death rates or time lost in industry on account of sickness.

"One thing at least should be plain," they say, "and that is that he who says, without qualification, 'I am against health insurance,' or 'I am for health insurance,' is speaking out of the greath depths of ignorance or great heights of prejudice. There is not one health insurance, but many, and each has a multitude of features, some good and some bad. It is more than within the bounds of probability that this country will follow the example of so many others and try some system of health insurance. Whether that system will bring all the evils along with what is good in previous systems depends upon how wisely those who write its terms pick and choose among the already ample experience of other nations."

This study was financed by the American College of Dentists in coöperation with the research projects of the Committee on the Study of Dental Practice of the American Dental Association, which in turn is coöperating with the Committee on the Costs of Medical Care.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XV JULY, 1932 No. 7

MEDICINE AND PUBLIC WELFARE*

MELVIN S. HENDERSON, M.D.
Rochester, Minnesota

MEDICINE has advanced along a changing front. Medieval medicine's outstanding contribution was the hospital. The Renaissance contributed anatomy, the science of which gave birth to the handicraft of surgery. The latter part of the sixteenth century and the early part of the seventeenth, the age of Shakespeare and of Milton, an era of an outstanding individual accomplishment, gave to medicine such men and achievements as Harvey and his "De Motu Cordis," Malpighi and his microscope, and Sydenham, who with disdain ignored his contemporaries and emphasized the value of individual clinical observations. Men of this type, by their efforts and accomplishments, raised the social status of the men of medicine. The eighteenth century saw the real beginning of modern surgery, and John Hunter plucked it from its empirical base and placed it on the firm pedestal of physiology and pathology. Jenner, by his work on smallpox, placed preventive medicine on a scientific basis, and Frank really founded public hygiene. The nineteenth century, particularly the second half, saw modern scientific medicine well launched on its meteor-like advance. Laennec, Graves, Stokes, Bright, Addison, Hodgkins are names familiar to all, and the work of Pasteur and Lister resulted in scientific surgery. The twentieth century is here, the medical profession is part and parcel of it, and is drifting with it. There is no doubt that thus far, now well into the first half of the century, the trend of medical activities is social. Our chief problem today is to see that all the vast harvest of medicine's accomplishments is made use of and that the mass of people will have the benefit of the knowledge so painstakingly gathered. Individualism in medicine, so far as it is good, should be retained, but the old, virile, independent, aggressive type, and the guild-like attitude of the profession as a whole, must adjust itself to the modern trends of society. We are in the midst of a period of social unrest and dissatisfaction with things as they have been and are, and each country and commonwealth must face its own problems. Numerous and widespread economic factors are so affecting the lives of all that contemplation of them is bewildering and straight thinking very difficult.

SOCIAL ASPECTS OF MODERN MEDICINE

Medicine's sphere in the maintenance of the social status of a people has to do particularly with their state of well-being and health, collectively and individually. As the causes of disease have been determined, preventive medicine has increased in importance. Social workers a generation ago were concerned chiefly with living conditions consequent to poverty, caused by unfair conditions of employment. Although poverty is still present in a considerable degree, social conscience has been awakened and the terrible conditions do not exist en masse as they formerly did. Social workers are more and more turning their attention to the relationship of poverty and disease. Consequent to the ever increasing work of preventive medicine, has come a change in the character of medical practice. Typhoid fever is today more a problem for the sanitary engineer than for the physician, diphtheria has lost its terror, yellow fever and malaria are under control, and epidemics of all kinds are fewer in number. Many of the ills that a generation or more ago kept the practitioner busy are seen no more. We must realize these facts and be prepared for even further changes. It might be called the irony of fate that most of the changes are due to our own efforts for we have individually and collectively worked to make our service less in demand. As one prominent educator stated: "It is an example of a profession literally committing suicide." This is as it should be, and is in accord with our cherished traditions. All this has served to change the character of the relationship of the physician to the families he serves. The old type of house-to-house visiting practice is waning, and exists only in isolated spots to any degree. Much that was fine has gone with it and the physician is not, as formerly he was, the family counsellor.

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*Presidential address before the Minnesota State Medical Association, St. Paul, Minnesota, May 23 to 25, 1932. From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota.

ECONOMIC ASPECTS OF MODERN MEDICINE

Medical economics is becoming a much used and a loosely used term. It has to do with the laws or methods affecting the production, distribution, and consumption or use of medical services. Important economic changes it seems are in the making as evidenced by the fact that in June, 1931, of a total of 33,302 patients in the Veterans' Bureau Hospitals, 53 per cent of the men were under treatment for disabilities not related to service in the army. In England the seriousness of such a situation has been seen and the same type of case has been reduced 40 per cent. Being in this transition period it is difficult for us to see just whither we are drifting and to be certain which changes will be temporary and which will be permanent. What the basic causes are we find equal difficulty in determining. For centuries the lives of men as individuals and the forms of their governments and various methods of organization for protection and advancement were comparatively simple, but within the last century in particular advances have been beyond the wildest dreams of man. Life, and with it our governments, has become complex, and the socialistic and paternal tendencies of the latter have become increasingly difficult to keep within reasonable bounds. So many material things have been developed, greatly increasing the comfort of all men, that there seems no end to what each may possess. With all these have come burdens of maintenance, with its great costs, financial and otherwise. A distinguished philosopher, aged and in the sunset of life, recently made the remark that he doubted whether all these things had in reality added anything appreciable to the sum of human happiness. Medicine as an intricate part of our social and economic system has participated in this tremendous advance, and it must naturally share in the burdens that go with a more intricate and complex system.

In many of the lay periodicals, and in some books, the charge has been made that the cost of bringing to our patients medical care, meaning not only physicians' services but all that goes with the care of the sick, such as hospital, and nursing, is entirely too great. The tumult and the shouting that have gone on about this particular phase of social and economic affairs appear a little out of proportion, but those who render personal services of the character rendered by members of the medical profession must expect that enthusiasm and thankfulness will tend to diminish as health returns and the patient pays the bill. Many rhymes and ditties have been written which reflect this attitude and should not be lost sight of in the philosophy we must acquire. Perhaps more than any other nation we are prone to pass laws to overcome our difficulties. Very often, after the law is passed, things go on as before, and the whole matter is endured or forgotten. Because the medical profession is best qualified to pass on and to judge the merits of the many and varied measures concerning health that come before our legislative bodies for enactment, it has become increasingly necessary that we be represented at legislative assemblies all over the union. Such efforts have been public spirited and unselfish. If they were otherwise, it would be impossible to have the continued and increasing support from members of the medical associations that is being given to such work. The greater proportion of the profession, provided the facts were known, would not countenance measures that were primarily self seeking.

The rank and file of medicine is composed of persons of more than average education, and I believe of intelligence. They are a prey to the same temptations that confront their brethren in other walks of life, and the opportunity to stray is constantly present. They are, owing to the character of their work, in a position to prey on the emotions and credulity of those who come to them. The traditions and the standard of ethics of the profession and the ideals of what is called organized medicine have helped more than anything else to keep the vast majority steadfast to these principles. I am convinced, by reason of many things, difficult to appreciate when enumerated singly but more weighty when considered in mass, that our profession does resist the temptations to evil more successfully than any other group with the exception of the ministry. No other group, individually or collectively, works to make its services less in demand. That this is true is evidenced by the fact that President Hoover in casting about for something comforting to say at this time has reminded the nation that "its health was never better." This is no visitation from on high, but is largely the result of the constant campaigning of public health education. In spite of this, our public health workers see many problems that need solution, and practitioners all over the county in increasing numbers are coöperating with them, even to their own ultimate loss. Although a few medical men are unethical in their dealings, give unnecessary treatments, charge too much, split fees and stoop to other evils, they are, as a matter of fact, very unusual physicians. Patent medicines are not fostered by the medical profession although they are considered part and parcel of medical cost. We have noted with much misgiving that more blatant advertising of claims for nostrums are appearing than for many years. Also, there is a campaign, evidently fostered by the press, to persuade the medical profession to advertise. This is undesirable, and should be guarded against, for it is being advocated in many instances, clothed in very plausible attire. Such a plan is a wolf in sheep's clothing.

The affairs of medical service are best understood by the medical profession and we should solve our own problems without outside interference. We have the advantage of seeing various types of socialized medicine in Europe. If in our trend to a more socialized type of medical service mistakes are made, it will not be because of lack of example. None is as satisfactory for all concerned as our system, even with the faults we know exist. The panel practice of England compensates the less efficient practitioner better than he was compensated before. There is still some dissatisfaction on the part of the medical profession of Great Britain with their treatment under the National Health Insurance Act. The most serious difficulty in the situation seems to be the power that the Approved Societies wield and which, it appears, is interposed between the patient and his physician. These societies wield great political power and their disappearance seems desirable for the sound working of the act. In France the profession abruptly awoke to the fact that they were confronted with a measure wholly unsatisfactory to them which had been prepared by the politicians. The profession united in a vigorous protest and refused to serve under the act. The result was that the restrictions as to treatment were modified, disciplinary measures were left in the hands of the profession, the patient was made responsible for a fair portion of the cost of treatment, thereby encouraging economy, and professional secrecy was ensured.

It is evident that the provision of medical care for the people is a proposition that sooner or later appeals to all politicians. We must therefore be prepared through our legislative committees in the various states to offer intelligent advice to the legislative assemblies when these matters are up for action.

The systems of medical care in Germany and Scandinavia were introduced long ago, in the days of the monarchistic regime, and medical education has been so conducted as to provide practitioners who would practice under such conditions of bureaucratic control. Such conditions of practice would be at this time quite unsatisfactory to the medical profession and to the public in this country. There would have to be considerable change in the general economic structure of government to make it fit. If changes are to be made it is within our power to guide legislation along these lines into paths that would tend under such a system to bring to the people the best that medical science can give. This object would be definitely defeated if the compensation that would come to practitioners under the system was inadequate to support them and their families in a manner that is their due. Such a happening would result in a lowering of educational standards that would lead men poorly qualified, not only by lack of educational background but by the lack of those inherent qualities that go to make the faithful physician, into an occupation that they could not properly fill.

Our national, state and county organizations have functioned in the past for the best interest of the profession and the people they serve.

We must see to it that the educational facilities for the training of physicians are what they should be. This, according to our American system, rightfully belongs to the commonwealth. In Minnesota we have just reason for being proud of our state medical school. Our school ranks with the best in the country, so we may safely assume that the man who graduates in medicine from the University of Minnesota is qualified. Secondly, practice must be controlled. From time immemorial quacks and faddists have flourished in all civilized countries. They have been a constant menace to the public and an irritation to our profession. In Minnesota our basic Science Act demands that all those holding themselves out to treat the sick demonstrate a certain knowledge of the fundamentals, anatomy, physiology, pathology, hygiene, bacteriology, and chemistry. If they know these things, there is no real reason why they should not apply the treatment they consider best suited to the case. The number of poorly educated cultists practising in the state is steadily diminishing and will continue to diminish unless their schools provide better training in the basic sciences, so that those applying can show to the board that they possess the fundamental knowledge necessary to make their treatment safe. Moreover, the Medical Practice Act compels the registering each year of all physicians, regular and homeopathic, all osteopaths and chiropractors, thus making conditions difficult for impostors. Thirdly, leadership of medicine in public health measures must be attained. Our State Medical Society has been back of the legislative actions that put the aforementioned laws on our statutes and also the two-year limit on malpractice suits. Our Legislative Committee has convinced the legislators that we are working for the best interests of the people of the state. We benefit indirectly; for what is to the interest of the people makes for better conditions of practice. Minnesota was a pioneer in public health matters, and the Minnesota Department of Health is nationally known for its progressive work and has the confidence of the profession of the state. Our State Medical Society has a permanent salaried secretary who is also secretary of the Minnesota Public Health Association, thus assuring contact with that body. The aim of our organization is to keep in touch with all activities that have to do with matters pertaining to the health of the people of the state, helping where it can, discouraging misdirected or faulty efforts, and encouraging those that are good.

Medicine is both an art and a science. The art of medicine will tend to shrivel and die under the direction of a bureaucracy. In theory it is conceivable that the science of medicine could be carried out under such conditions, but difficulties arise when it is put into actual practice. The subject to be administered to is man with all his frailties, emotions, crudities, ideas, desires, and so forth. The art and science of medicine must go hand in hand.

ACUTE APPENDICITIS*

A REVIEW OF ITS SYMPTOMS, DIAGNOSIS AND TREATMENT

STATISTICAL REPORT OF 346 CONSECUTIVE CASES OF ALL TYPES

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THE symptoms of acute appendicitis are fairly constant, and the sequence in which they occur is of diagnostic importance. In a person otherwise well, acute abdominal pain, severe and colicky in character, is the earliest and most constant symptom. Frequently it is described as a stomach ache felt all over the abdomen. Occasionally it is referred to the epigastrium, rarely to the pelvis or the left side, but most often to the umbilical region. The colicky character soon subsides, and coincidently with this it becomes gradually localized in the right iliac fossa. This usually occurs within the first six to twenty-four hours. The cause of the pain is believed to be due to a swelling and edema of the mucous membrane with an occlusion of the lumen, causing an active peristalsis with a further involvement of the muscular coats. If the pain ceases suddenly without abatement of the accompanying symptoms, one of several changes may have taken place:

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*Retiring president's address at the annual meeting of the Ramsey County Medical Society, January 25, 1932.

1. Perforation of the appendix with a beginning peritonitis.
2. Dislocation of a fecal concretion or other obstruction into the cecum with the consequent emptying of its contents.
3. Gangrene may have developed, especially when the pain ceases less abruptly.
4. With a gradual subsidence of the pain and a corresponding improvement of the other symptoms, recovery will probably occur.

If perforation or gangrene has taken place, a secondary pain develops which denotes a peritoneal involvement. If there are no delimiting adhesions, a rapidly spreading peritonitis occurs, which is indicated by an aggravation of other symptoms and a board-like rigidity of the abdominal muscles, including that of the diaphragm, thus limiting the respiratory movements to the chest.

Nausea and Vomiting.—This is usually considered reflex and occurs within a few hours after the onset of pain. It is rarely absent and seldom persists beyond one or two attacks. If it recurs after the primary subsidence, it denotes a spreading of the infection and may persist until a fatal termination ensues.

Abdominal Tenderness.—Similar to the nausea and vomiting, this is reflex in character. At first superficial and diffuse, with the localization of the pain in the right lower quadrant, the sensitiveness becomes most marked in this area. With the progress of the infection and extension of the process to the serous membranes, rigidity of the overlying muscles develops. The degree of sensitiveness and rigidity varies, not only with the severity of infection and the reaction of the patient to pain, but also depending on the proximity of the appendix to the anterior abdominal wall. Further, the point of greatest tenderness indicates quite accurately the site of the appendix. Whether it be at McBurney's point or remotely situated from the usual area, the reaction is the same. If the tenderness is elicited only on deep pressure, a deeply situated or retrocecal appendix may be suspected.

Fever.—A moderate rise in temperature is a constant and early symptom in acute appendicitis. It follows directly upon the occurrence of pain and tenderness. Its presence or absence is highly significant from a diagnostic standpoint and for an accurate determination it is often advisable to take a rectal reading. It is seldom high and in most instances ranges between 99 and a fraction to 102 or slightly above. In children and in some fulminating forms, the rise is more rapid and not infrequently reaches 103 or more. The degree of elevation depends to some extent on the character of infection, the amount of absorption and the reaction of the patient, but is no index to the extent of involvement, since in many instances of very extensive involvement, the temperature may register only slightly above normal. If, after the initial rise, there is a rapid subsidence, this may denote a beginning gangrene or a perforation with a release of pressure and a temporary cessation of absorption. In either instance a secondary rise occurs as the process advances either to a localized abscess or a general peritonitis. As a rule there is an acceleration of the pulse accompanying the rise in temperature but this has no significance except in advanced cases, where, as part of the picture, it becomes weak, rapid and thready. A fatal termination then usually follows.

Leukocytosis.—As in other inflammatory conditions associated with a febrile reaction, a rise in the white cell count, chiefly affecting the polymorphonuclears, commonly occurs. In the early stage, like the temperature, it is seldom high but may persist after the initial rise of the fever has subsided. Again, like the temperature, it is a reaction to the absorption of products of infection, but because of the variability of the type of infective flora and the difference in the sensitiveness of each individual, due allowance for these factors must be given before deductions can be made. Indeed, a leukocytosis may be absent, even in perforative cases and when a general peritonitis is present.

Associated Conditions.—Constipation in association with appendicitis is common, but frequently the bowel function is normal and in occasional instances, an attack may be preceded for several days by diarrhea. Irritability of the bladder with frequent micturition may occur but this is more common in children. The decubitus is often characteristic, the patient usually lying on his back or right side with the thighs flexed. This position relaxes the ileopsoas and thus gives a certain amount of relief.

COURSE AND TERMINATION

Not infrequently the initial attack is so mild and the symptoms so transitory that little attention is paid to the condition until sooner or later a recurrence takes place in a much more aggravated form. In the well defined case, the disease usually reaches its height in from twelve to forty-eight hours. From this on there are several possibilities:

1. *Resolution and Gradual Recovery.*—After the primary symptoms have persisted from two to three days, the temperature gradually subsides. The swelling and edema of the appendix recedes, the muscular rigidity becomes less pronounced, the appetite returns and the bowels regain their function. By the end of a week the symptoms may have all disappeared, except for a slight tenderness over the appendix, which usually persists after all other signs have disappeared.

2. *Localized Peritonitis with Abscess Formation.*—In the more severe type, the inflammatory process rapidly extends through the walls of the appendix and causes a localized peritonitis or a persistence of the obstruction to the lumen, causing an increased pressure within the appendix and a consequent necrosis of the mucous membrane with a liquefaction of its contents and a subsequent rupture. This may take place in any part of the appendix but more commonly occurs within the leaves of the attachment of the mesentery at its weakest point or not infrequently at the site of a fecalith, causing ulceration with a surrounding zone of gangrene. As a result of the perforation a certain amount of the appendiceal contents escapes directly into the peritoneal cavity. If delimiting adhesions take place, an abscess results. If the pus escapes between the leaves of the mesoappendix, a mesenteric abscess develops. In other instances the location of the abscess varies with the site of the appendix. Without intervention the process may subside and the abscess become absorbed or encapsulated or it may continue to enlarge and extend in the direction of least resistance. It may perforate into a coil of adherent intestine or other adjacent hollow viscus and so empty itself. It may perforate the posterior peritoneum and extend along the great vessels or even open directly into them, causing fatal hemorrhage. If extension takes place in an upward direction, a sub-diaphragmatic abscess may form; if it gravitates in a downward direction, a pelvic abscess is the result. In rare instances when the tip of the appendix stretches across the abdomen and perforation takes place at its extremity, the abscess may be situated wholly in the left lower quadrant of the abdomen. Finally perforation may take place in the free cavity, resulting in a general peritonitis.

3. *General Peritonitis.*—In the rapid fulminating types, perforation or gangrene takes place early before delimiting adhesions have formed and general peritonitis results. The character of the symptoms is more intense from the onset. The pain and tenderness are diffuse and may not become localized. The rigidity involves all of the muscles of the anterior abdominal wall. Peristaltic action of the bowels ceases and on auscultation the abdomen is quiet. Respiration is costal. The decubitus is dorsal with knees flexed. The pulse is accelerated and the temperature usually high. The above description refers to the early stage. Later the local reaction is less pronounced, the abdomen becomes distended, the constitutional symptoms more decided with high fever, chills and sweats and a rapidly fatal termination.

DIAGNOSIS

In the average case where all of the symptoms are present and in the absence of complications, the diagnosis is usually easy. Unfortunately, however, due to difference in individual reaction and frequent anatomic anomalies of the appendix, the diagnosis may in an occasional instance remain in doubt until the abdomen is opened. No single symptom or group of symptoms are in themselves diagnostic. Any one or all of the so-called cardinal signs, except pain, may be absent or altered. It is only when the clinical picture is viewed as a whole, taking cognizance of the sequence of symptoms, that a sound interpretation can be made. Murphy stressed the presence of temperature and the order in which the symptoms occur. He questioned the diagnosis in all cases in which there was an absence of temperature in the early stage or in which the order varied. Almost always the order is as follows: pain, nausea and vomiting, tenderness and rigidity, rise of temperature and leukocytosis.

Of the diseases which most commonly may be confounded with appendicitis are those characterized by acute abdominal pain, namely, acute biliary or renal colic, gastric or duodenal perforation, ruptured tubal pregnancy, twisted pedicle or acute salpingitis. In most instances, however, with a careful history and physical examination, and with the aid of laboratory tests of blood and urine, a decision can usually be reached.

TREATMENT

Before entering upon the discussion of the treatment, two pronouncements should be made. First, no opiates should be administered before the diagnosis has been established and the manner of treatment decided upon, since they mask the symptoms and lure the patient into a false sense of security. Second, no cathartics should be given at any time during the active stage of the disease. They increase the peristaltic action of the bowels and by so doing spread the infection mechanically.

First Stage.—In the first stage of the disease the treatment is appendectomy. The rationale of this procedure cannot be questioned. Early operation removes the lesion, prevents recurrences and lessens the hazard of complications. It is the safest form of treatment and unless there is some definite contraindication, operation should be performed as soon as the diagnosis has been made. It cannot be too strongly emphasized that the opportune time for intervention is while the disease is still confined to the appendix. This is the time of election; the safe period when the disease may be completely eradicated with practically no more risk than there is in doing an exploratory laparotomy. When the infection has once spread beyond the confines of the appendix, whether it be in the form of pylephlebitis, septico-pyemia or peritonitis, the mortality immediately mounts. It is true that in a number of instances there is a tendency to recovery, but no one has yet been able to propound a single sign or symptom in this stage whereby a favorable termination can with any degree of certainty be foretold. Besides, as pointed out by Royster, acute appendicitis is a "going concern" and the relief of the immediate symptoms in no wise signifies the obliteration of the disease. One attack usually presages another and not infrequently an early perforation or perhaps, if less virulent, a local point of infection remains, which may become more or less dormant, but nevertheless may produce far reaching and damaging results.

Postponement of active interference is justified only (1) in the presence of more serious disease elsewhere in the body; or, (2) when there are definite signs that the patient when first seen is progressing to recovery.

In neither of these groups, however, has the necessity for operation been vitiated in the least. The offending member is still present and should be removed, but at a more favorable time.

Second Stage.—During the increase in the inflammatory process which usually occurs from the second to the fifth day, one would expect to find at operation a thick swollen appendix bathed in pus, a perforation or gangrene with a spreading peritonitis. This is the period in which Maurice Richardson expressed his famous epigram "too late for early operation and too early for late operation." A violent controversy raged between surgeons about a quarter of a century ago, whether to operate or not to operate in this stage. Nor is the question much nearer solution now than then. Favorable statistics may be had on either side. But from this difference in opinion came two well defined methods for the management of these cases. They are known as Ochsner and Murphy treatments.

Ochsner devised his plan especially for those cases coming under observation almost hopelessly ill with a perforative appendicitis and diffuse peritonitis. The object is to still peristalsis in the small intestine and favor localization of the process. Briefly this plan is as follows:

1. Fowler's position.
2. Repeated gastric lavage for nausea and vomiting.
3. A large dressing to abdomen held in place by a binder (for protective purposes).
4. Nothing by mouth.
5. No cathartics. No large enemas.
6. Proctoclysis with 10 per cent glucose in saline with 1 to 2 c.c. of tincture of opium to each 500 c.c.
7. Morphine sulphate gr. ¼ with atropine sulphate gr. 1/150 as indicated for pain. This regime is continued until the patient's temperature

APPENDICITIS—346 CONSECUTIVE CASES

		Number	Per cent
I.	Acute appendicitis	153	44.2
II.	Subacute appendicitis	40	11.6
III.	Chronic appendicitis*	151	43.6
IV.	Miscellaneous:		
	Tuberculosis	2	.6
	Carcinoma	0	.0
	Total	346	100.0

*Chronic appendicits.
A. Low grade appendicitis.
B. Recurrent appendicitis.
C. Interval appendicitis.

ACUTE APPENDICITIS

Age	Males	Female
1-10	8	3
11-20	24	23
21-30	24	25
31-40	12	8
41-50	8	7
51-60	2	3
61-70	4	1
71-80	0	1
	82	71

ACUTE APPENDICITIS—SEASON

January	11
February	21
March	16
April	6
May	12
June	9
July	10
August	9
September	14
October	17
November	17
December	11
Total	153

ACUTE APPENDICITIS

Previous attacks	73
Number	1 to many
Duration	1 month to 15 years
First attack	80
Complications:	
Pregnancy	1
Tonsillitis	1
Cathartics	2

ACUTE APPENDICITIS—153 CASES

Symptoms (subjective)	Number	Per cent
Abdominal pain	153	100.0
Nausea	68	44.4
Vomiting	77	50.3
Anorexia	18	11.8
Constipation	11	7.2
Diarrhea	7	4.6
Fever	17	11.1
Chills	3	2.0

ACUTE APPENDICITIS—153 CASES

Physical Signs and Laboratory Findings

	Number	Per cent
Tenderness (abdominal)	153	100.0
Muscle rigidity	109	70.9
Mass	7	4.0
Distension	7	4.7
Rectal (tenderness)	5	3.3
Leukocyte count	6,000–36,000	
Temperature	96.0°–104.0°	
Pulse	60–140	
Duration	6 hours to 1 month	

Note:
Temperature—
Normal......(96.0 to 98.8)........ 53
Elevated.....(99.0 to 104.0)........ 90
Not recorded........ 10

has been normal for four days. Diet is limited to liquids before operation.

It should be borne in mind that this plan is not intended as a substitute for operation but merely as a preparatory treatment until such time as the symptoms may have subsided, making the operation a relatively safe procedure. It is not recommended for either the very young or the aged.

Quite contrary to Ochsner's views, Murphy found just as positive indications for operation in this as in the first stage. "But," he says, "the operation must be a limited one, that is, simple opening of the peritoneum for the relief of pus tension in the infected area, with the removal of the appendix if it be accessible and easily amputated. There should be the least possible separation of agglutinations or other trauma to the infected tissues and no excessive manipulations, sponging, flushing, adhesion separating or prolonged operation." He further advised drainage in all severely acutely infected cases even though the appendix is not perforated. In the main, his after-treatment consisted in placing the patient in Fowler's position and the administration of saline solution per rectum. In each instance an attempt is made to make the patient retain 750 c.c. of the solution every two hours. Both of these plans have their advocates. Personally, I have the feeling that, if for any reason operation is refused or, by force of other circumstances, interference is judged inadvisable, the Ochsner treatment is perhaps the most rational non-operative treatment devised. On the

ACUTE APPENDICITIS—153 CASES

Treatment

			Mortality	
	Number	Per cent	Number	Per cent
I. Appendectomy with closure....	101	66.0	1	0.7
II. Appendectomy with drainage	32	20.9	2	1.3
III. Drainage only	20	13.1	2	1.3
	153	100.0	5	3.3

Note: Mortality in Groups II and III (52 cases) was 4 (7.7 per cent). In the group of intercurrent, subacute or chronic cases (193) there was no mortality.

ACUTE APPENDICITIS—153 CASES

Complications and Sequelæ

1. Peritonitis	1
2. Secondary abscess	5
3. Obstruction	1
4. Fecal fistulæ	1
5. Pneumonia	2
6. Acute dilatation of stomach	1
7. Wound infection	4
8. Miscellaneous:	
Infected finger	1
Hemorrhage from wound	1
Empyema	1
Phlebitis	3
Psychosis	1

ACUTE APPENDICITIS—153 CASES

			Mortality	
	Number	Per cent	Number	Per cent
A. Acute suppurative appendicitis	108	70.6	1	0.7
B. Acute suppurative appendicitis, perforation with—				
1. Local peritonitis	5	3.2		
2. Abscess	11	7.2		
3. General peritonitis	19	12.4	3	2.0
C. Gangrenous appendicitis with—				
1. Local peritonitis	3	2.0		
2. Abscess	0	0.0		
3. General peritonitis	7	4.6	1	0.6
	153	100.0	5	3.3

ACUTE APPENDICITIS—153 CASES

Deaths

	Age	Sex	Cathartics	Leukocytes	Temperature	Pulse	Time ill	Operation
1. Acute suppurative appendicitis	52	F.	0	18,700	103	100	7 days	Appendectomy and closure
2. Acute suppurative appendicitis with perforation and general peritonitis	61	M.	0	....	97	82	18 hours	Appendectomy and drainage
3. Acute suppurative appendicitis with perforation and general peritonitis	12	M.	0	....	0	0	3 days	Drainage only
4. Acute suppurative appendicitis with perforation and general peritonitis	20	M.	0	....	0	0	3 days	Drainage only
5. Gangrenous appendicitis with general peritonitis	66	M.	0	21,300	101.2	106	2 days	Appendectomy and drainage

other hand, with the patient in a hospital, where a competent surgeon is available and the after-treatment can be supervised, it would seem that the patient would be safer with some form of drainage at any stage of the disease and removal of the focus when possible. By so doing we relieve the body of infectious material which it would otherwise have to absorb. But as pointed out by Murphy, the operation should be a limited one and frequently consist of nothing more than an incision and provision for adequate drainage.

Third Stage.—If the inflammatory process subsides without localization of any appreciable amount of pus formation and the symptoms improve correspondingly, interference may well be postponed until such time as the inflammatory process has more or less completely disappeared. If there is abscess formation, the patient should be carefully watched. Small collections may possibly become absorbed but an abscess of any appreciable size should be incised and drained, since there is always a possibility of perforation, either into the free peritoneal cavity or some adjacent viscus. In an occasional instance, perforation may take place into an intestinal loop and a spontaneous recovery take place. But no dependence can be placed on such a fortunate termination.

Fourth Stage.—In the intercurrent or quiescent stage no emergency exists but the patient should be advised:

1. That acute attacks recur in a large percentage of cases.
2. That once an appendix has been affected, perforation may occur very early in a subsequent attack.
3. That a chronic infection may result in adhesions and flexions, causing disturbances of the digestive tract.
4. That the diseased appendix may remain as a point of focal infection.
5. That the operative risk during this stage is almost nil.

The technic which I have come to use in most all cases of appendicitis is as follows: The incision is an oblique right rectus, about two to three inches in length, the upper end being at the outer border of the muscle, then running obliquely inward and downward across the fibers. The muscle fibers are separated about 0.5 to 0.75 inch from the outer edge. The peritoneum is carefully opened between two forceps. The appendix is located either by following the ventral longitudinal band of the caput coli to its base or by finding the terminal ileum and following it to the ileocecal junction. If these methods fail, either a non-descent or a failure of rotation must be considered. When posible, the appendix with the caput coli is brought to the surface. The meso-appendix is clamped, ligated and then divided. The base of the appendix is similarly clamped and ligated. After division, the stump is cauterized with iodine and invaginated with a purse string of silk or linen. The stump of the appendix should always be ligated before invaginating, since fatal hemorrhage into the intestine may occur if this is omitted. This simple technic with closure of the abdomen without drainage. is used in the early acute or intercurrent stage.

In the second or progressive inflammatory stage, if mobilization of the caput is difficult or if great induration exists at the head of the cecum, making invagination difficult or impossible, the base of the appendix is simply ligated with silk or linen and cauterized without invagination.

DRAINAGE

In the beginning of this period of progressive inflammation we may find an unperforated appendix with a localized peritonitis and a quantity of serous or sero-fibrinous exudate. The question at once arises whether or not to drain. Closure is safe only when there is no necrosis of the tissues, no dead body cells and no bacteria in the exudate. Microscopic examination of a smear during the operation is of value only when positive, since bacteria may be present even with a negative slide. Not only should the extent of the process and character of the fluid be taken into consideration but also the general condition of the patient, since the latter furnishes an index to the toxicity of the infection present. In general it may be stated that, if, after the removal of the appendix, no questionable necrotic tissue is left behind, if the amount of fluid is small and not turbid and the peritoneum only slightly or moderately congested, the abdomen may be closed without drainage. In the rapid fulminating types, drainage should be instituted, whether the appendix is perforated or not.

The material used for drainage should be either rubber tubes of ample size and length or empty cigarette drains. Two or three medium sized cigarette drains may be used in place of a single tube. In case of a diffuse general peritonitis, drainage should be provided, both at the site of the appendix and in the pelvis, and in order to be effective the tubes must extend to the bottom of the cavities.

In the event of abscess formation, drainage should be provided at a point most easily accessible. The general peritoneum should be protected as far as possible by packs before an abscess is opened. The free pus may be aspirated or cautiously sponged out. The cavity should be explored sufficiently to locate all ramifications in order to efficiently drain all portions. In the presence of a pelvic abscess, drainage may be readily provided in the female by an incision through the posterior vaginal fornix. In the male, when the abscess is low in the pelvis and bulges into the rectum, the first thought would be to drain by this route. But I would hesitate before attempting this method since the abscess cavity may later become impacted with feces. In a single instance, which occurred in my series, I drained a huge abscess successfully through an incision made to the right of anal sphincter and parallel to the bowel. The dissection was carried out bluntly with one finger in the rectum as a guide until the abscess wall was reached. The wall was perforated by a small stab and enlarged with forceps. A large rubber tube was inserted for drainage. Recovery was uneventful.

Drainage is usually required for seven to ten days—seldom less but sometimes more. It is unwise to disturb or attempt to shorten the tubes until the acute inflammatory symptoms have subsided. If there is much swelling and local wound reaction, a moist pack is of benefit.

POSTOPERATIVE TREATMENT

The technic of the operation is admittedly important but it is only part of a life saving measure, and unless it is followed by an equally efficient after-treatment, success is not likely to follow. The immediate indications are to lessen the absorption of toxic products and replenish lost body fluids.

The first proposition is met by placing the patient in Fowler's position and the second by the administration of large quantities of saline solution or saline solution with 5 per cent glucose added. In severe cases an adult patient should receive no less than 3,000 c.c. of the solution during the first twenty-four hours and thereafter as indicated, but the total daily intake should not fall much below this amount until the patient is well on the way to recovery. The first 1,000 c.c. may best be given by hypodermoclysis during the operation. Immediately after the patient has been put to bed, proctoclysis is started, preferably by the gravity method as advocated by Murphy. If the patient absorbs sufficient quantities of the fluid, nothing further is needed, but if the quantity is less than the required amount, it should be replaced either by hypodermoclysis or intravenously. The important point is the amount, not the method.

For the relief of pain, morphine or codein should be administered. In young children codein should always be the choice. Morphine is unsafe. It is better to promote rest and sleep than permit the patient to expend his energy in restlessly tossing from one part of the bed to another. As improvement takes place, or usually in twenty-four to forty-eight hours, sips of hot water may be given by mouth and cautiously increased. On the third or fourth day a liquid diet is gradually begun. The bowels are moved by enemas as required. Cathartics and pituitrin are contra-indicated.

The accompanying charts show an analysis of the records of 346 consecutive cases of all types of appendicitis operated upon by the writer at Bethesda Hospital during the past decade. Cases in which the appendix was removed incidental to other operations are not included.

I am very much indebted to Dr. C. E. Johnson for reviewing the histories of the cases in connection with the tabulation of this report.

MYODINE, SUBIDIN AND SANGUIODIN NOT ACCEPTABLE FOR N. N. R.

On account of the exploitation of certain "water-soluble" tinctures of iodine, claimed to be less irritant than, and therefore superior to, the official preparations Compound Solution of Iodine (Lugol's Solution) and Tincture of Iodine, Torald Sollmann, in 1919, published a report comparing the properties of the official solutions with those of the proprietary preparations. It was found that the official preparations were actually somewhat less irritant to the skin than the secret or nonsecret "miscible tinctures"; that the simple alcoholic solution of iodine was best for "disinfection" of the skin and that the delayed protein precipitation by the U. S. P. tincture would probably render it somewhat superior for the disinfection of open wounds. The Council on Pharmacy and Chemistry reports that there appears to be a recrudescence or a continued vogue of proprietary preparations advertised with claims similar to those made for the discredited "water-soluble" tinctures. The Council reports that Myodine, Subidin and Sanguiodin are stated to be products of the I-O-Dine Laboratories, Inc., Philadelphia, marketed by Eimer and Amend, New York, claimed to be "proteinized" or "vegetized" iodine solutions, prepared by combining "crystal iodine . . . with seaweeds and vegetables which have an affinity for iodine digested by a special process." The Council found Myodine, Subidin and Sanguiodin unacceptable for New and Non-official Remedies because they are unscientific modifications of an official article, marketed with unwarranted claims and indefinite and incorrect statements of composition under proprietary, uninforming names. (Jour. A. M. A., February 20, 1932, p. 639.)

PERFORATING LESIONS OF THE LARGE INTESTINE

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THE three common causes of perforation of the large intestine, exclusive of violent injury, are diverticulitis, chronic ulcerative colitis and carcinoma. It has been shown* that perforation occurs in 3.4 per cent of cases of chronic ulcerative colitis. In such cases the diagnosis of the disease has usually been established, or if the patient is seen just at the time of perforation, it can be established by careful anamnesis. Our study concerns the relative incidence, the diagnostic features, and the nature of the perforation by diverticulitis or by carcinoma.

In the fifty cases in our series the perforations were all due to diverticulitis or to carcinoma. This was confirmed either at operation or at necropsy. Symptoms suggestive of perforation were present in all cases; they differed from those common to the various forms of acute, subacute and chronic obstruction of the colon. The fifty cases were selected from 116 consecutive cases of diverticulitis of the colon and 1,502 consecutive cases of carcinoma of the colon, in which operation was performed at The Mayo Clinic. In fifty-two of the 116 cases a diagnosis was made at operation of perforation by diverticulitis, and in 141 of the 1,502 cases, by carcinoma. Clinical, preoperative and historic data were available in only thirty of the cases of diverticulitis and in nineteen of the cases of carcinoma. In the fiftieth case there was a perforating carcinoma at the splenic flexure and a perforative type of diverticulitis with formation of abscess in the descending colon; thus there were fifty-one lesions in the fifty cases.

AGE AND SEX

Twenty-five of the patients with diverticulitis were men and six were women. One of the men was in the fourth decade of life, nine each were in the fifth and sixth decades, and six were in the seventh decade. Three of the women were in the fifth decade, two were in the seventh, and one was in the eighth. The youngest man was aged thirty-eight years, and the oldest sixty-six. The youngest woman was aged forty-six years, and the oldest seventy-seven.

Seven of the patients with carcinoma were men, and twelve were women. One man was in the fifth decade, three were in the sixth, and three were in the seventh. One woman was in the fourth decade, five were in the fifth, five were in the sixth, and one was in the seventh. The patient with carcinoma and diverticulitis was a man aged sixty-nine years. The youngest man was aged forty years, and the oldest was sixty-nine. The youngest woman was aged thirty-seven years, and the oldest was sixty-six.

TYPE OF PERFORATION

In seven of the cases of diverticulitis, perforation resulted in an inflammatory mass and in eight cases abscesses formed. In three of the latter a draining fecal fistula had followed drainage of the abscess elsewhere. In the sixteen remaining cases spontaneous fistulas formed, two perforating into the small intestine and fourteen into the bladder. This suggests the fairly common origin of vesicocolonic fistula by diverticulitis.

In eight of the cases of carcinoma, including the case of diverticulitis and carcinoma, perforation with inflammatory reactions had occurred, and in four cases gross abscesses were present. In one case a lesion of the transverse portion of the colon had perforated, forming a fistula into the stomach, and in one it had perforated onto the gastric wall. In two cases there were fistulas into the bladder, and in one case a perforation onto the posterosuperior wall of the bladder would in all probability have developed into a fistula. In two cases vaginal fistulas had developed. The manner of perforation of the two lesions varied. In diverticulitis, a severe, rather acute process tends to form an abscess with liquefaction necrosis of surrounding tissues and perforation into adjacent viscera provided the wall of the abscess has not formed quickly enough, whereas in carcinoma there is slow growing through an organ with the attendant infection which is necessarily associated when bacteria are carried with the lesion.

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*Bargen, J. A., and Jacobs, M. J.: Perforation of the colon in chronic ulcerative colitis. Arch. Int. Med., 43:483-487 (April), 1929.

SITE OF PERFORATION

The site of such lesions is significant. The diverticulitis occurred in the sigmoid or lower part of the descending colon in thirty of the cases, and in one case it occurred in the cecum. Carcinoma occurred in the sigmoid in six of the twenty cases; four occurred in the cecum, four in the transverse colon, two in the rectosigmoid, and one each in the ascending colon, hepatic flexure, splenic flexure and descending colon. Thus, of the carcinomas, ten occurred in the left half, six in the right half, and four in the transverse portion of the colon.

SYMPTOMS

Pain was the most common symptom, being present in twenty-six of the thirty-one cases of diverticulitis, and ranging in degree from slight pain in eight cases, to severe pain which could be classified as acute in twenty-three cases. In thirteen of the cases of carcinoma, pain was present severe enough to be called acute, in one case the pain was less severe, and in the other six cases pain was not a prominent symptom. Factors causing the pain were mentioned by eight patients. Three attributed the pain to riding on a train, one patient to walking on crutches, one to a fall, one to cold water, one to manipulative massage and one to pitching grain.

Fever was present in twenty-one cases of diverticulitis; it was associated with chills in nine. In ten of the cases, the temperature ranged from 100° to 104° F.; in seven of these it was 102° F., or more. In twelve cases of carcinoma there was a history of fever; in five it was associated with chills. The temperature in these cases was lower; in only three was it more than 101° F.

Vomiting was present in five cases of diverticulitis and in two cases of carcinoma.

An abdominal mass was present and palpable in twelve of the cases of diverticulitis and in eight of the cases of carcinoma. In only one of these was the mass palpated by vagina.

In one case of diverticulitis, blood was present in the stools at the time of onset of pain, and in one case "inky" stools were passed.

In the whole group there were sixteen vesicosigmoid fistulas, only two of which were caused by carcinoma, the other fourteen originating in the perforating diverticulitis. The site of the lesion undoubtedly is a factor in this incidence. As has been stated, in thirty of the cases of diverticulitis, the lesion was in the sigmoid, and in only six of the cases of carcinoma was the lesion in the sigmoid. Additional symptoms in these cases were: urinary frequency, dysuria, and the passage of blood, pus, feces and gas by urethra. The duration of these symptoms ranged from two weeks to five years, but in most cases the fistula was present less than nine months.

It was estimated that the majority of these patients presented themselves at The Mayo Clinic within three months from the onset of symptoms. A careful analysis of the two groups of patients suggests a fairly distinctive picture for each group. In diverticulitis there are the symptoms of acute or subacute perforative appendicitis of the left side. In carcinoma the perforation could be considered subacute or chronic. In diverticulitis there is usually an antecedent history of exacerbation of similarly mild attacks with complete or almost complete remission of symptoms, and finally a more severe attack resulting in perforation and formation of abscess. In carcinoma there is gradual progression of a lesion infiltrating and growing through the wall of the bowel, resulting in a chronic but progressive process. In such cases the sudden dissolution of the wall of the bowel and acute abscess formation does not occur. Hence walling off of the process in most cases probably keeps pace with perforation. In carcinoma, therefore, obstructive features frequently antedate those of perforation or at least mask the latter because they are not severe or acute. On the other hand, an active inflammatory process occurring in a thin-walled pouch-like diverticulum with a bottle-neck must cause more severe "explosive" symptoms if proper protection from adjacent viscera is not at hand.

The sigmoid portion of the colon of men lies in juxtaposition to the posterior wall of the bladder and diverticulitis is most common in the sigmoid; hence it is easy to understand why a vesicosigmoid fistula should result relatively frequently. The fact that the uterus lies between the bladder and the sigmoid makes perforation among women less likely. It seems fortunate that diverticulitis occurs in a portion of the colon where proximity of organs to omentum and mesocolon are so situated that the abscess usually becomes walled off. It seems surprising that patients tolerate the passage of blood, pus, feces and gases through the urinary bladder as well as they do.

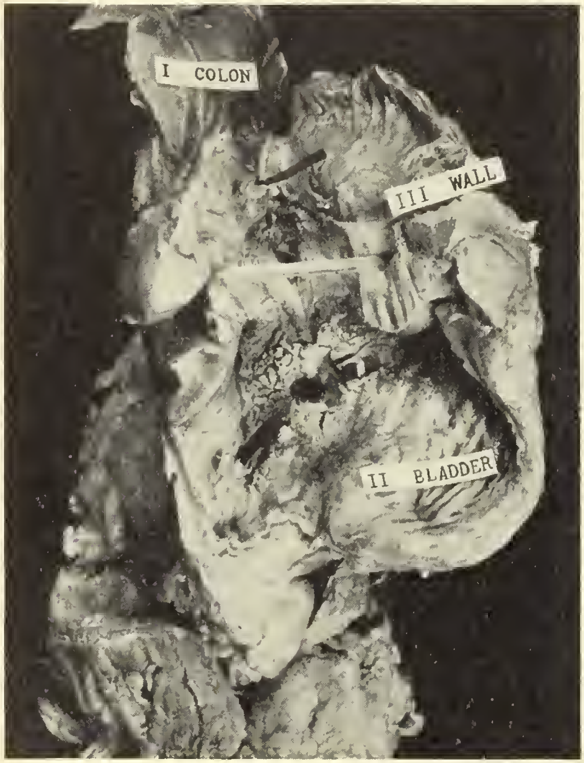

Fig. 1. Specimen of bladder and sigmoid with hugely thickened and inflammatory wall between them. Arrows point to the perforation.

In ten of the cases, fistula had been present more than two years, before the patient came for examination, and in one case had been present for five years before the patient arrived at the clinic. The diagnosis of perforative diverticulitis would seem then to rest on a history of recurrent left sided appendicitis with mild obstructive features, sudden severe pain and a tender, relatively immobile mass in the lower left part of the abdomen, and fever usually 102° F. or more, associated with chills. When the perforation apparently is occurring slowly, with marked obstructive features and other signs of carcinoma such as anemia and bleeding, and a relatively mild degree of fever, usually below 102° F., carcinoma with perforation should be suspected. Contrary to the usual belief, age is of little if any significance, both conditions occurring usually between the fourth and eighth decade, the greater number being in the fifth and seventh decades. Besides these important historic data the usual laboratory diagnostic aids employed in the diagnosis of any rectal or colonic lesion come into play. The sigmoidoscopic examination may establish the diagnosis. Usually, however, the condition is too acute to warrant intracolonic manipulation and so roentgenologic observation must often be delayed until acute symptoms have subsided.

An interesting factor in the types of inflammatory lesions caused by carcinoma and diverticulitis is that in carcinoma the inflammation is carried through the wall of the bowel with the growth, whereas in diverticulitis perforation of a diverticulum in the serous surface of the bowel occurs. This may be the chief cause of early vesical perforation. An illustrative case follows:

A man, aged sixty-nine years, came to The Mayo Clinic, February 15, 1929, because of recurrent attacks of pain to the left and below the navel which had begun three months before admission. Occasional mild attacks of intestinal discomfort had been present for thirty years. The pain was more severe on defecation; there was some looseness of the stools, nausea and vomiting and a little fever. The first attack lasted one week. After several weeks of relief a second similar attack occurred and during the three months there had been a series of attacks, with 25 pounds loss of weight. In the month prior to admission urination was painful, with passage of gas through the bladder. Fecal matter had not been seen in the urine, and it appeared fairly clear.

The patient's temperature was 103.2° F., he appeared ill, and the tongue was parched and dry. There was a mass in the left lower quadrant with some abdominal rigidity. Repeated examinations of the urine revealed pyuria graded 4 and albumin graded 2 and 3. Leukocytes numbered 10,800, and the concentration of urea was 29 mg. in each 100 c.c. of blood. A diagnosis of diverticulitis with abscess and fistula into the bladder was made. The condition was too acute to attempt a roentgenogram with barium. Daily fever and marked tenderness continued until obstructive symptoms increased and cecostomy was performed. The patient died the day after the operation, due to intestinal obstruction and peritonitis (Fig. 1).

SUMMARY AND CONCLUSIONS

Fifty patients with perforating lesions of the large intestine were observed. Multiple attacks of pain in the left lower quadrant of the abdomen, and finally severe acute pain favors the diagnosis of diverticulitis. Symptoms of perforation and fever tending toward higher levels pointed to diverticulitis. A vesicocolonic fistula suggested the probability of diverticulitis. When there is gradually increasing chronic obstruction with superimposed symptoms of perforation, with fever below, rather than above 102° F., malignant disease should be suspected. Diverticulitis is more prevalent among men than among women.

CLINICAL SIGNIFICANCE OF MELENA*

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BECAUSE of the multiplicity of possibilities in considering the causes of gastro-intestinal hemorrhage, the search to explain the source of the melena will never cease to have its uncertainties. For a period of several years and until recently, melena occurring when the history is either very indefinite, or there are no data, and when it has not been possible to demonstrate gastro-intestinal lesions by the roentgen rays, has been regarded as being due to obscure extraneous causes, such as disease of the liver, of the spleen, or one of the various blood dyscrasias that had not been identified clinically. Formerly, when gastro-enterostomy was done for peptic ulcer with clinical and roentgenologic confirmation, the external signs of ulcer were not always apparent. However, since surgical procedures have been resorted to, such as partial gastrectomy, pyloroplasty, and the opening of the stomach and duodenum in exploratory operations for bleeding lesions, it has been found that intrinsic lesions of the duodenum, stomach, or intestinal tract usually are the cause of gastro-intestinal hemorrhage. As a result of the study of large numbers of patients with duodenal and gastric ulcers, it has been estimated that there is gross bleeding in approximately 20 to 25 per cent of the cases at some time during their course. The bleeding in peptic ulcer undoubtedly is frequently occult, and tests for occult blood in the stools will occasionally be positive. However, in practically all cases, the bleeding of peptic ulcer occurs in the form of fairly large gastro-intestinal hemorrhages, evidenced by secondary anemia and several days of tarry stools, and it is this occurrence that brings the patient to the attention of his physician.

The history given by a patient with peptic ulcer may be so characteristic that in certain instances, especially in cases of continued melena, it is unnecessary to subject him to further investigations before surgical procedure is advised. In other cases there are no symptoms except those associated with the hemorrhage, and in still others the history is somewhat suggestive of peptic ulcer but associated with other features so indefinite as to make a clinical diagnosis uncertain. The group in which the history is uncertain and the group of silent bleeding peptic ulcers comprise an appreciable percentage of bleeding peptic ulcer. There are certain duodenal ulcers and duodenitis types of lesions in which the roentgenoscopic signs of ulcer are not in evidence. Consequently, there is a fair-sized group of bleeding duodenal ulcers and bleeding from areas of duodenitis in which a dependable clinical diagnosis is impossible, and these cases must fall into the group of indeterminate gastro-intestinal hemorrhage with the cause of the hemorrhage remaining unexplained until surgical exploration is carried out.

In 1930 roentgen diagnoses of all types of duodenal ulcer were made in 1,684 cases; in 527 of these (31.3 per cent) operation was performed, in nineteen of which exploration was done and ulcer was not demonstrated. In the same year there were twenty patients operated on following a clinical diagnosis of duodenal ulcer and evidence of duodenal ulcer was not detected by the roentgen rays but duodenal ulcer was found at operation. In other words, during that year there were thirty-nine of 527 surgically checked cases in which the characteristic roentgen-ray signs of duodenal ulcer were not visualized.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Submitted for publication March 5, 1932.

In a recent publication Moynihan referred to deaths occurring due to gastro-intestinal hemorrhage from acute gastro-duodenal ulceration. Acute gastro-duodenal ulceration may occur in the presence of systemic infection. This, of course, may be the cause of the hemorrhage in some cases of the indeterminate group; however, it probably is of rather infrequent occurrence.

It has been suggested that gastro-intestinal hemorrhage may come from the gallbladder, but positive evidence to substantiate this has been lacking, and the consensus of opinion is strongly against this possibility. Recently a patient having had a gastro-intestinal hemorrhage followed by severe secondary anemia had an exploratory operation to discover the source of the bleeding. A carcinoma of the ampulla of Vater was found. In this case jaundice had not been present.

During the four years of 1927, 1928, 1929, and 1930, a diagnosis of indeterminate gastro-intestinal hemorrhage was made in seventy-five cases. These patients all gave either an indefinite history or no history, except that associated with the hemorrhage. Of this group of seventy-five cases, only eighteen came to surgery. In ten cases the bleeding lesion was found; in two cases an intrinsic gastric lesion was found, there being no evidence present that the lesion was responsible for the bleeding; in five cases the exploration was negative; however, the stomach and duodenum were not opened, and in one case no explanation was found for the bleeding after the stomach had been opened.

Gross bleeding in carcinoma of the stomach is much less frequent in contrast to that from gastro-duodenal ulcer. Although the lesion in cases of carcinoma of the stomach may not be diagnosed by roentgenograms as such, it is very unusual that a diagnosis of a normal stomach is made in the presence of carcinoma.

In 1921 Eusterman and Senty reported twenty-seven cases of benign tumors of the stomach which had been examined at The Mayo Clinic between the years 1907 and 1921. The salient points brought out were: (1) myoma and fibroma were the most common benign tumors and polyposis was the least common; (2) the ratio of benign to malignant gastric tumors was about 1 to 200; (3) symptoms were not present in any of the twenty-seven cases, in seven of which palpable tumors were present; in ten, recurrent gastro-intestinal hemorrhage had occurred; (4) roentgenologic signs* of large benign gastric tumors could not be distinguished from those of malignant lesions of the stomach, and (5) gross hemorrhage or occult bleeding producing severe secondary anemia, and occasionally a picture of pernicious anemia, is the most outstanding clinical characteristic of benign gastric tumors.

In 1930 in the clinic there were 365 cases in which successive roentgenograms of the small bowel were made. With the exception of two cases, one a case of tuberculous enteritis and another a case of chronic ulcerative colitis which had extended into the ileum, roentgenograms of the small bowel in the absence of obstruction were of no value. As an example, five cases are mentioned in which roentgenograms were of no assistance, gastro-intestinal hemorrhage being a symptom. The cases are as follows: (1) fibrosarcoma of Meckel's diverticulum; (2) pedunculated lipoma of the jejunum; (3) inoperable growth of the ileum; (4) bleeding ulcer of the ileum near the base of a Meckel's diverticulum, and (5) carcinoma of the jejunum without obstruction.

In 1931 several lesions of the small bowel have been visualized by the roentgen rays. In attempting to explain certain cases of secondary anemia, Conner found successive positive tests for blood in the stool. Following a process of elimination of the remainder of the gastro-intestinal tract by roentgen-ray examination, a clinical diagnosis of probable lesions of the small bowel was made, and the lesion was found surgically. Five such cases occurred in one year.

In cases in which the history is not definite and in which the data are negative, the possibilities of cirrhosis of the liver, Banti's disease, and diseases of the blood should be ruled out.

Roentgenoscopic studies of the colon are so accurate, especially since the injection of air following evacuations of the barium enema, that errors in the diagnosis of lesions of the colon are practically nil. In a review of the cases of gastro-intestinal hemorrhage, it was noticed that diverticulosis of the colon was frequently found. Hemorrhage from diverticulosis, to our knowledge, has not been seen in the clinic. In conclusion, it might be suggested:

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*Since 1921, due to the increasing roentgen-ray knowledge of these lesions and with improvement of technic, an accurate diagnosis of benign tumors of the stomach has been made in a high percentage of cases.

1. In a surgical exploration for the source of gastro-intestinal hemorrhage in which the bleeding lesion is not found, the abdomen should not be closed until the stomach has been opened and explored for intrinsic lesions.
2. In cases of recent hemorrhage a healed or chronic duodenal ulcer should not necessarily account for the hemorrhage.
3. Infrequently gastro-intestinal hemorrhage occurs from esophageal varices in the presence of cirrhosis of the liver which is impossible to diagnose clinically. The hemorrhage is usually manifested by hematemesis and rarely by melena alone.
4. All cases of recurrent gastro-intestinal hemorrhage should have surgical exploration, and in many cases of indeterminate gastro-intestinal hemorrhage it might be extremely detrimental to the patient not to explore surgically because of only one attack of hemorrhage.

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UNITED STATES PUBLIC HEALTH SERVICE

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The Public Health Service of the United States is an unique institution. It is the oldest Federal public health group in the country; it was organized in 1798. Its medical corps is composed of doctors, from the Surgeon General at the head, to its lowest commissioned officer, assistant surgeon. Dentists and sanitary engineers are also included among its commissioned officers.

Doctors are without doubt a most individualistic body. They have existed from time immemorial without any head or director. They trace their cult to Æsculapius and take their code of ethics from Hippocrates, and every one is a law unto himself after he qualifies for the practice of his profession. Yet out of this group there has been built up an organization that functions without friction not only among its own members but with the great body of physicians in general.

It is not an organization that has sprung full-grown from an act of Congress, but rather one that developed and has grown up with the nation. It came into existence in the early days of the Republic. Washington had only just retired and John Adams was conducting the administration. A bill was introduced, the purpose of which was the care of sailors who were ill. It was a noble and humane gesture on the part of Congress to provide for the sailors; but, like many gestures, it had an inside story. The Merchant Marine of that time was a very promising industry, but not strong financially. By an old law of the sea, shipowners were responsible for the care of their sailors that fell ill, and, as sanitary laws were unheard of at that time, there were many of them ill. This bill was drawn with the intention of benefiting the shipowners, and it passed, through sympathy for the sick sailor; and thus the Marine Hospital Service, the seed of the present United States Public Health Service, came into existence.

There is something fascinating in the study of an organization that has existed over the century mark, for it shows the combined results of several generations of thought and experience.

The Marine Hospital Service required funds for its maintenance then as it does now; but to-day Congress appropriates several millions for this purpose, while in the early times its expenses were met by an assessment on the wages of the sailors of twenty cents per month. This assessment was not left to their good will, but was collected by the "Customs" officers. Then it was turned into the United States Treasury, where the Secretary of the Treasury of those far days doled it out to the Marine Hospitals according to their needs. This explains why originally the Public Health Service was under the Department of the Treasury, where it has remained even to this day.

Later the sailor's assessment was raised to forty cents per month. Though this was changed in the course of time, there are still living sailors who can boast that they assisted in building the hospitals that are now caring for them. The sailor's assessment was later abandoned for a tonnage tax, and it would be interesting to know just who introduced a bill and secured its adoption that on its face was against the interests of the powerful shipowners of the time and in favor of the sailor, who never had very much power in Congress. Or did the ship-owners in the interest of justice sponsor such a bill? However this was, the burden was lifted from the shoulders of the sailors and put on the shipowners, where some say it originally belonged.

The name of an organization is often a sort of compressed history of its origin and object; but the Marine Hospital Service in its frequent changes was more, for it shadowed dimly the trials through which the young nation passed, before its real meaning, of many people, with many ambitions, united under one Government for the common good, could be fully grasped.

During that "internecine" struggle referred to as the "civil" war, Marine Hospitals situated in the South in some instances gave "comfort and support" to those who were considered "enemies" by the United States Government. Just whether this was treason or patriotism could only be determined by the outcome of the war. It might also have been simply a humane act.

There seems to have been a sort of penal intention, however, in the change of the old and honorable name of Marine Hospital Service to that of Federal Service. Perhaps on account of its offensive educational value, this name did not last long and in 1902 it was changed to the "Public Health and Marine Hospital Service." This name was not without an irritating reminder either. In 1912 the slate was wiped clean and it became the United States Public Health Service —a broad title which it is carrying gallantly.

The United States Public Health Service has ramifications not only in every State in the Union but in every civilized country. It has a research laboratory, the National Institute of Health in Washington, that is perhaps unequaled, and a body of five thousand officers and employees, with almost that many more doctors in coöperation with it. In 1889 it was reorganized along quasimilitary lines; its officers are commissioned by the President and its ranks are similar to those of the Medical Department of the Army.

At the present time it functions under eight administrative divisions—Scientific Research, Marine Hospital and Relief, Foreign and Insular Quarantine, Domestic Quarantine, Sanitary Reports and Statistics, Venereal Diseases, Mental Hygiene, Personnel and Accounts.

Though the words "Marine Hospital" were dropped from the title it did not mean that the service for the sailors was abolished. One of the most active divisions of the Public Health Service is that of Marine Hospitals and Relief. It has twenty-five Marine Hospitals and a large number of outpatient stations and contract hospitals, for it was from the beginning the policy of the institution to contract for service in hospitals already built except where it is not economical to do so. This is a plan that might have been followed with great economic value to the nation by more recent institutions.

There are constantly more than four thousand sailors and others having a legal right to treatment in these hospitals, besides nearly double that number of out-patients.

The first dental officer was appointed and commissioned in 1919, and during the last fiscal year 52,763 patients received dental treatment.

The cost of maintaining the Marine Hospital Service is a little over five million dollars yearly, and about one-tenth of this amount is returned through various pay patients, including immigrants. The cost of running these hospitals is estimated at four dollars per patient per day.

The first Marine Hospital was built in Norfolk, Virginia, and the second in Boston. The Marine Hospitals antedated the Navy Hospitals, and it was the old Boston Marine Hospital that cared for some of the American seamen wounded in the war of 1812 fighting under Captain Jacob Jones, as well as his English prisoners. The Marine Hospital for the tuberculous at Fort Stanton, New Mexico, was built in the days when climate was unduly exalted in the cure of this disease, which accounts for its location, more like a "hideaway" than a place for a public institution. The same might be said of the old military hospital at Fort Bayard, now of the Veterans' Administration in the same state, which is in the heart of the desert. However, the advantage of a dry, warm climate in the treatment of tuberculosis is not even in this day to be scoffed at. The rule of this hospital was to admit only those who had a good chance of recovery. This action was of great psychological value at a time when it was difficult to convince even doctors that tuberculosis was not a fatal disease. It was here that the admirable custom was introduced of providing pay work for the patients nearing their discharge, not only for the mental effect of earning but also to test out their recovery.

The National Leper Home at Carville, Louisiana, is also under the supervision of the Public Health Service. Three hundred and sixty patients are being cared for at present, and very extensive research work is carried on with the object of control and cure of leprosy. While Chairman of Rehabilitation for the National American Legion Auxiliary in 1922 I visited this home, in the interest of eleven former service men whose much sadder fate than to die on the battlefield was to contract this disease. The place was in good sanitary condition, and paid employment is furnished to practically all patients capable of performing small services and desirous of being employed. Approximately fifty-five different patients with salaries ranging from $15 to $30 per month are constantly employed in keeping clean the cottages that are occupied by lepers, feeding the blind and carrying out simple nursing procedures under competent direction. They are also encouraged to keep vegetable and flower gardens and to raise chickens and indulge in other enterprises that may properly be undertaken on the reservation.

Besides its hospitals, the United States Public Health Service has in charge many other marine activities that make for the welfare of the public. All American boats are required by law to carry at least sixty-five per cent "able-bodied seamen," and their physical fitness is passed on by medical officers of this Service. It also gives instructions in first aid at forty-three different ports to prepare officers to meet the demands of the Steamboat Inspection Service. It examines all persons seeking license as pilot, master, mate or engineer for vision and color vision and general physical condition, all of which make for safety in traffic by the sea.

The Public Health Service stands ready and equipped to take its place at any point of danger from disease, whether the call comes from the State or Municipal Officers or is an order of the National Government. Doctors fighting an epidemic in any part of the country can and do call on it for advice and assistance. From 1919 to 1922 it was the principal agency designated to care for the hospitalizing of the sick and wounded of the Great War, and it will always be a matter of regret to the nation that this service was not expanded to meet that need instead of creating an entirely new organization, of which the best we can hope is that in time it will come to learn as much as the Public Health Service already knows.

The Public Health Service was the first to use the radio for broadcasting talks on health and it answers, through certain designated Marine Hospitals, all calls from the sea through the radio for advice in case of sickness on shipboard.

The gateway to immense activities for the Public Health Service was "Quarantine." This was most nautral, as its doctors in the Marine Hospitals in different ports were the first to come in contact with plague, smallpox, yellow fever and typhus, carried in by ships. As railroad traffic increased, infected patients often quickly scattered through the country, and coöperation with the various State Health Officers became an urgent need. It was some time before the different States saw the necessity for some central authority for the prevention of the spread of disease, for these were the days when "State Rights" was a burning question. Eventually a system of national quarantine was established. We think very little and know very little about this great sheltering activity that stands guard over the health of the nation.

The ordinary lay person has no idea how many times the specter of bubonic plague has stood even with a foot on shore at our ports and how promptly it has been met by quarantine. Nor have we any conception of what the plague can do to a country once it is established. We have never seen whole towns and cities left as desolate as a forest swept by a fire. We have some idea of the ravages of yellow fever, for this country has seen an outbreak that brought death and desolation to many Southern cities and that advanced as far North as New York. That we have been saved the terrible scourges that so often devastated Europe, and that are still devastating India and China, is due to our active and competent quarantine.

There is no body of men to whom this country owes more—not even excepting those who laid down their lives to preserve the Union—than to the doctors who at the imminent risk of their own lives fought and are fighting the unseen foes that again and again menace our shores. The brunt of this battle is met by quarantine under the direction of the Public Health Service.

It works under two divisions, Foreign and Domestic. The Foreign gets its information on any outbreak of disease or the possibility of infected ships entering our ports from the office of the American consuls abroad, from its medical officers, and from the nations themselves. The American consuls in turn get their information from the health officers in the different countries where they are stationed and from whatever other sources possible. A weekly bulletin of health at foreign ports is dispatched to the Public Health Service and when necessary a cablegram is sent. It has happened that ships sailing from ports where epidemics broke out after their departure had their first information of the fact on entering our ports. This was in the days before radio broke the silence of the air.

Domestic quarantine is carried out in coöperation with the health officers of our States and cities. It was established in 1910 and functions along these lines: Enforcement of quarantine between the States, control of the water supply on railways and steamboats and all interstate carriers, sanitation in the national parks in cooperation with the National Park Service, prevention of trachoma, studies in rural health sanitation, annual conference of State and territorial authorities with the Public Health Service.

The first paragraph of the regulations of the Division of Domestic Quarantine under the Public Health Service is very instructive:

"For the purpose of interstate quarantine the following diseases shall be considered contagious and infectious diseases: Plague, cholera, smallpox, typhus fever, yellow fever, typhoid fever, paratyphoid fever, dysentery, pulmonary tuberculosis, leprosy, scarlet fever, diphtheria, whooping cough, epidemic cerebrospinal meningitis, anterior poliomyelitis, Rocky Mountain spotted or tick fever, gonorrhea, chancroid, anthrax, influenza, pneumonia, epidemic encephalitis, septic sore throat, rubella and chickenpox." Paragraph two of the same regulations provides:

"Any person or thing, either living or dead, which has been unduly exposed to, or in intimate contact with or is infected with any of the diseases enumerated in Section One, except as otherwise provided in these regulations, shall be regarded as contagious or infectious until the contrary has been proven and if found in any car, vessel, vehicle or conveyance undergoing interstate transportation shall be subjected to such inspection, disinfection or other measures as may be necessary to prevent the spread of infection from them."

It may be seen from the foregoing that this activity alone involves a tremendous amount of work and carries a great responsibility. The appropriation for this division for the year ending 1929 was a little over half a million dollars, for the interstate quarantine work, rural sanitation, trachoma and plague work and other activities.

One of the most important activities of the Public Health Service is its investigations of the diseases of man. These studies are conducted both in laboratories and in the field. The principal laboratory of the Public Health Service for the conduct of such studies is the National Institute of Health located at Washington. There are several other laboratories, such as the laboratory at Cincinnati, where the Stream Pollution studies are conducted, and the laboratory at Hamilton, Montana, where vaccine for Rocky Mountain spotted fever is prepared.

The studies relating to malaria, pellagra, various industrial hygiene problems and similar matters of interest to the public health are conducted at various places throughout the country where favorable opportunities present themselves for such investigations.

While it is true that in the United States as elsewhere a large amount of research connected with the safeguarding of public health is carried on by private agencies, there are, nevertheless, compelling reasons why the Federal Government itself should be represented in this field. A careful analysis will show that by far the greater part of the research work conducted under private agencies is directed to the solution of problems that are almost entirely local, or problems that pertain to curative rather than to preventive medicine. On the other hand, the Federal Government, being interested in the welfare of the entire population, concentrates its efforts upon problems affecting large groups and upon preventive rather than curative methods.

There are problems requiring observations widely distributed in a geographical sense, and other problems which can be solved only by the concentration of many different research activities working in coöperation and simultaneously. In addition to all of these reasons, there is, of course, the Government's obligation to promote the welfare of the people—an obligation that is not shared by outside agencies which, properly enough, have their own end in view in many of their activities.

Many contributions to modern hygiene and medicine have been made by the research workers of the Public Health Service. Observations made by a Service Officer as to the incubation period of yellow fever materially aided in the discovery of the method of its transmission. Studies made by the Service have shown that pellagra is a disease caused by improper diet and that the prevention and cure of the disease lie in eating a well balanced diet. The identification of the American species of hook-worm as the cause of a widespread anemia was accomplished by an officer of the Service and has resulted in a notable diminution of the prevalence of this disease. The cause of tularemia, or rabbit fever, a newly identified disease epidemic in the United States, was discovered by an officer of the Public Health Service. This disease has now been found in all of the States except three or four of the New England States. It has also been recognized in Japan, Canada, Russia and Norway.

An officer of the Service has developed a vaccine for the prevention of Rocky Mountain spotted fever, a highly fatal disease prevalent in certain of the Western States.

Within the past few months announcement has been made of the discovery by research workers of the Public Health Service that the flea is the means of spread of epidemic typhus fever, a Public Health problem recognized in the United States within the past few years. In connection with these studies, it has also been found that Rocky Mountain spotted fever, formerly thought to be confined to the Rocky Mountain region, has probably existed along the Eastern coast of the United States for several years. Cases formerly believed to be a severe type of typhus fever have now been positively identified as Rocky Mountain spotted fever of the Eastern type.

With the occurrence a year or two ago of an entirely new disease which came to be known by the name of "Jake" paralysis, or "Jamaica Ginger" paralysis, the Public Health Service was called upon to assist in the study of this problem. The exact cause and means of prevention of the disease were worked out by the Service. It was found to be caused by the drinking of Jamaica ginger extract which had been adulterated with tri-ortho-cresyl phosphate. The prevention, of course, is obvious; avoid drinking Jamaica ginger containing this poisonous substance.

In 1929 the Narcotic Division was established for the care of the victims of habit-forming drugs and out of this sprang the Division of Mental Hygiene for the scientific study of the causes that lead up to drug addiction. Another act of the same year authorized the care by the Public Health Service of all prisoners in Federal institutions.

From this brief account it will be seen that the Public Health Service is a most powerful body for the promotion of the public health. The fact that it is not a voluntary organization but directly under the control of the Government adds to its usefulness and stability. The secret of its coöperation with the doctors outside its ranks is that all doctors are bound together by the tie of a single purpose, which is service to the human race.

It is extraordinary that such a force so intimately connected with our personal good should be so absolutely unknown to the great majority of the people, and this can be explained only by the fact that it does not advertise itself. This is of course in keeping with the noble ethics of the profession; but if we persist in being unknown except through our work, we will run a great chance of not being appreciated. However, in this age it is refreshing to find any group satisfied to be known by their works only.

CERTAIN TYPES OF DIARRHEA OF UNCERTAIN ETIOLOGY*

Philip W. Brown, M.D.
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THE inaccurate term "colitis" has come to cover a multitude of abdominal complaints, which vary from dyspepsia to severe diarrhea or partial intestinal obstruction. The loose application of this term in given cases has led not only to delay in correct diagnosis, but has caused many patients to feel that they have serious intestinal disease. I think the term should be sharply restricted in application to those cases in which actual inflammation of the colon can be demonstrated. But after this group is definitely established, there remain fully two-thirds of the patients who also suffer from, or are annoyed by, diarrhea, and it is this larger group which taxes the ingenuity of the physician and constitutes a generous part of the clientele of the food faddist, the quack, or the irrigator of colons. It is to the condition of patients of this group to which the term "colitis" should not be applied; the designation should be "disturbance in function of the colon," and care should be taken to emphasize that there is no true inflammation of the bowel.

In all cases of diarrhea, careful studies of the history and of evidence disclosed in the laboratory are conducted, stools are examined for parasites and ova; often cultures of stools are made; sigmoidoscopic examination, roentgenographic studies, analysis of gastric content, and often special examinations such as basal metabolism or cholecystograms are employed.

In cases of the four types of diarrhea which I shall consider, the studies mentioned have been carried out, and normal conditions have been found or else the findings bore no relationship to the diarrhea. True, Endameba histolytica may be present, and may be eradicated, and yet the intestinal symptoms persist. Anti-amebic treatment should always be carried out if the parasite is found, and often a therapeutic trial of emetine is valuable fully to rule out the possibility of unrecognized amebiasis.

From this large group of patients with diarrhea of uncertain origin, I have tried to distinguish four types which constitute only a part of the entire number of types.

IRRITABLE COLON

This term refers to a group of patients with intermittent or steady diarrhea, and often periods of constipation. They constitute the bulk of those who are considered to have "mucous colitis," "spastic colitis," and so forth. To them "colitis" is often a most important and serious condition, and they direct much thought to their abdomen. Their health and general appearance, except those who have been following freak diets, is good. They are not so much sick as they are annoyed by the intestinal irregularity interfering with work and pleasure. Frequently, constant use of cathartics or of daily colonic irrigations are outstanding features. I am continually impressed by the fact that these patients have all followed well-meaning but useless diets, and that their bowels have been "washed and washed."

Emphasis should be made on the absence of true colitis—the function of the intestine, rather than its structure, is disturbed. A simple, bland, and yet assorted diet is outlined. Use of purgatives and enemas is discontinued, although a small, warm, saline enema at bedtime may be used occasionally to aid in obtaining a good night's rest. If constipation is in the foreground, warm retention enemas of olive oil, of about 2 ounces (60 c.c.) are helpful. Mild sedatives should be used as needed, but other drugs are seldom indicated. Logan has often stressed that it is this group of people that needs a wise friend, rather than a specialist on the bowel. A vaccine prepared from intestinal organisms, to which the patient is sensitive, has been tried in some of these cases, as well as in some of the cases of allergy. Our results have been none too encouraging. This procedure is worth considering for some resistant, long-suffering patients, but I am not enthusiastic about its value. A few patients have received great benefit from a systemic reaction, preferably fever, following injection of a foreign protein such as peptone or typhoid vaccine. Miller, Alvarez, and others, have reported good results in some cases.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Billings Medical Club, Rochester, Minnesota, March 25, 1932.

REFLEX DIARRHEA

In smaller groups of cases the disturbance is of the reflex type. By this I refer to diarrhea which follows an attack of appendicitis, cholecystitis, pelvic infection or which occasionally is a prominent symptom of duodenal ulcer. Also, diarrhea is not uncommon as an early symptom of cardiac decompensation. Diarrhea frequently accompanies menstruation as a disturbance reflex. In other words, the intestinal activity is the result of a disturbance in some other organ, and its treatment rests entirely on the ability to correct this disturbance. Too frequently, cases of chronic diarrhea are seen in which the appendix, gallbladder, or uterus has been subjected to operation "in hopes that" and so forth. That the attempt is probably sincere does not make it useful. Unless a clear-cut cause and effect can be established, operation should not be undertaken for the purpose of curing diarrhea.

ALLERGIC DIARRHEA

Diarrhea and abdominal distress certainly constitute an intriguing field for the enthusiast in allergic problems. So much of the gastro-intestinal tract is inaccessible and the present tests are so unsatisfactory that it becomes all too easy to consider a case of diarrhea as probably allergic in origin. There are a number of cases which unquestionably are of allergic causation; these are the cases in which there are intermittent sharp spells of diarrhea. Some patients come to know what foods precipitate trouble, but others may find it necessary to keep a food diary in order to identify the offending substances. In cases in which the disturbance is steadily present, the elimination diets described by Vaughn or Rowe may eventually give a clue. But with gastrointestinal allergy, just as in allergy affecting other systems, the problem is not solely that of hypersensitivity to one food or group of foods, but rather a complex arrangement of the entire body, so that when fatigue, infection, worry, and so forth, are in a certain mixture, the explosion may occur. All are familiar with the person who can eat a certain food at a certain time without distress, whereas at another time it will precipitate headache, urticaria, or diarrhea.

For patients of this group, the diet, as always, should be as full and varied as is possible and foods must not be omitted unless they are definitely shown to cause trouble. Mild sedatives, judiciously used, are often helpful. Any factors contributing to decreasing general resistance should receive attention. Removal of a definitely diseased gallbladder, of active oral foci, or of a diseased appendix may indirectly improve the condition of these people, but such procedures should be carried out only after careful, conservative study. Indiscriminate procedures merely add to the nervous load and make it more and more difficult eventually to rehabilitate such a patient. I have felt that sodium ricinoleate (soricin) was of definite value in some of these cases. A member of our staff, who was intolerant of chocolate, remained tolerant to it for eight months after taking soricin three times daily for a month. Just recently, his hypersensitivity has recurred, and the recurrence came concurrently with a periapical dental abscess. I think that removal of the tooth and perhaps another month of taking of sodium ricinoleate will again increase his tolerance of chocolate.

DEFICIENCY DIARRHEA

Diarrhea as a result of dietary deficiency is not uncommon. It may follow faithful adherence to a deficient diet which was originally prescribed for an intestinal upset. The original cause may subside, but if the patient continues on the diet too long dysfunction may persist, I think because of the deficient diet. Or again, diarrhea may follow a limited diet which was undertaken to reduce weight, to control symptoms of ulcer, to control diabetes, and so forth. Usually these diets are self-imposed, or else are suggested by faddists, but unfortunately we cannot place absolutely all the blame for silly diets on quacks or deluded persons.

The stools of patients are usually not just the watery, mucus-containing stools of the types previously described, but are likely to be of greenish or grayish color, to have a foul odor, to occur mostly in the morning hours, and to be somewhat frothy. Secondary anemia is the rule. Stomatitis is common, and cramps of the extremities are frequently noted. The illness of these patients depends on the extent of dietary deficiency, as well as on the duration of the deficiency.

These patients closely resemble those who have true sprue, and some have features of pernicious anemia. Although the diagnosis of sprue may be difficult to exclude, careful studies of blood smears usually will settle the doubt of pernicious anemia. As a matter of fact, I think these patients really could be classed with those who have sprue; the difference is largely one of degree of severity, and that the patients of the type considered here are not subjected to the added influence of the heat of the tropics.

In treatment, the diet should be of low residue but highly nutritious. Rare beef is the chief food, with which may be included gelatin desserts, rice, clear soups, and toast. Vegetable purée and fruit should be added as rapidly as is consistent with the patient's progress. Milk is often poorly tolerated, as well as being bulky, and hence should not be included as a routine.

I feel that large doses of calcium are helpful, and prescribe 4 gm. of calcium lactate to be taken three hours after each meal. Large doses of iron, 6 gm. of ferric citrate daily, are given, if the patient is anemic. Since the iron may cause increase of the diarrhea, this dose may need to be decreased. Again, irrigations are not to be considered as a routine, although a warm saline enema at bedtime may be employed occasionally. Liver extract and ventriculin have been valuable in some of the more severe cases, especially in those which closely resemble tropical sprue. Biologic preparations are probably more of value from the standpoint of deficiency than they are for overcoming the anemia.

COMMENT AND SUMMARY

Since the greater number of cases of intermittent or steady diarrhea have proved difficult of accurate diagnosis, and since treatment frequently has been bizarre and unsound, I have endeavored to classify the cases into various groups or types. Only four types are considered at this time.

Unquestionably, the factors that serve most to prolong or even to produce diarrhea are fantastic diets and irrigations given as a routine. Less frequently but still too often ineffective surgical procedures are undertaken. By no means is operation to be opposed when reasonably indicative data are obtained, but removal of an appendix or a gallbladder simply because of chronic diarrhea is usually followed by nothing but dissatisfaction of everyone concerned.

In general, drugs play a minor part in treatment. The inert powders, such as bismuth or kaolin, may be tried, but often they seem merely to add to the material which must be excreted. In acute exacerbations, brief usage of narcotics, such as camphorated tincture of opium, is indicated but such a drug must not be too easily available to the patient. I have often stressed the value of a therapeutic trial of emetine hydrochloride to rule out fully the possibility of endamebiasis. Calcium lactate seems helpful in many cases of chronic diarrhea; perhaps it serves to restore the calcium balance, which is always disturbed in diarrhea. Sodium ricinoleate (soricin) seems to aid in allergic diarrhea but it is too new a preparation to have fully proved its value in these cases.

General improvement of physical and nervous condition is important. The judicious use of mild sedatives is often very helpful. Friendliness and common sense in the treatment of many of these cases is of more value than too great knowledge of bacterial flora, stasis, and so forth.

RENESOL

Nurosol Laboratories, Inc., sold "Nurosol" for epilepsy. Renesol Laboratories, Inc., sells "Renesol" for epilepsy. Nurone Laboratories, Inc., sells "Nurone" for epilepsy. Educational Division sells "Renesol" for epilepsy. Vitosol Corporation sells "Vitosol" for epilepsy. Phenoleptol Co. sells "Phenoleptol" for epilepsy. These are various trade names used by Charles Goldblatt and Maurice E. Goldberg in selling Phenobarbital (luminal) at an exorbitant price and under various trade-marked names as a "cure" for epilepsy. Of course they are much too shrewd to declare frankly that their many-named nostrum is a "cure," but the whole trend of their advertising is such as to lead the public to believe that they have a cure. The A. M. A. Chemical Laboratory made an analysis of Renesol. This analysis concluded that each capsule of Renesol contains essentially 0.064 Gm. (approximately 1 grain) of phenobarbital, to which has been added a small quantity of sodium bicarbonate. While epileptics could purchase 65 1-grain phenobarbital capsules for less than a dollar, they pay $4.50 to the Goldblatt-Goldberg combination for the same stuff sold under various fancy names with no warning as to the products' potentialities for harm. (Jour. A. M. A., February 20, 1932, p. 658.)

THE DIFFERENTIAL DIAGNOSIS OF JAUNDICE WITH SPECIAL REFERENCE TO CONGENITAL HEMOLYTIC JAUNDICE*

REPORT OF CASE

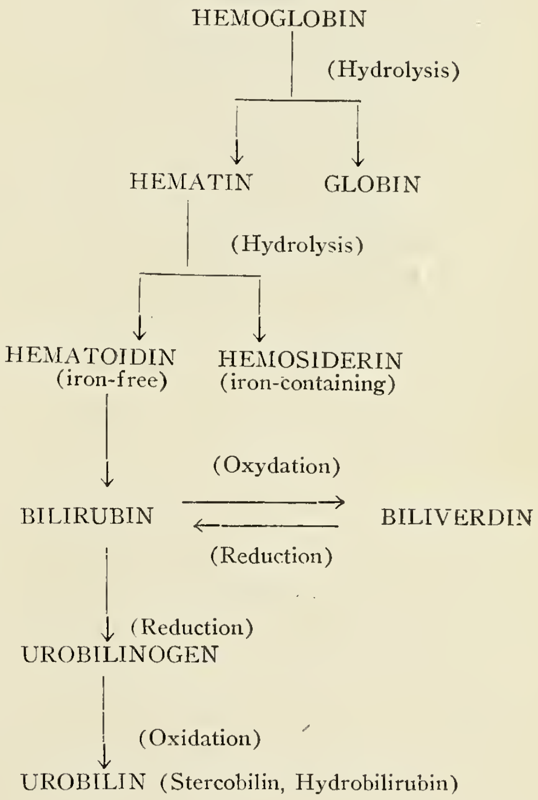
Moses Barron, M.D.
Minneapolis

The patient whom I am about to present is of considerable interest because of certain clinical and laboratory findings which are of great diagnostic importance. The patient, as you see, is markedly jaundiced. He states that he has been jaundiced since the age of eight, following an attack of typhoid fever. He says he has never been very husky but has enjoyed fairly good health in spite of the continuous and persistent jaundice for twenty years. At the onset of the jaundice, a mass was located in the left hypochondrium which was diagnosed as an enlarged spleen. The jaundice is of an intensity which one would designate as Grade 2; it is especially marked on the conjunctivæ. Before going into any discussion of the differential diagnosis of this case it might be well to consider briefly the general subject of jaundice and to try to determine where such a case as this should be classified.

The term jaundice may be defined as a condition characterized by a yellowish staining of the skin, mucous membranes and body fluids with the bile pigment bilirubin. It is an important symptom or finding which may be brought about by a large variety of conditions. Jaundice is generally classified as: (1) obstructive; (2) toxic or infectious; and (3) hemolytic. The bile pigment bilirubin which causes the jaundice is a derivative of hemoglobin and its production (Chart 1) may be briefly outlined as follows:

The red blood cells as they are taken up by the reticuloendothelial cells of the body, especially in the spleen, liberate the hemoglobin which is first changed into globin and hematin. The hematin is converted into hemosiderin and hematoidin, of which the latter is converted by the reticuloendothelial cells of the spleen, bone marrow and liver ("Kupffer cells") into bilirubin. The bilirubin is carried in the blood and through the portal vein to the liver, where it is taken up in the liver capillaries or sinuses by the parenchymal polyhedral cells and is excreted into the bile radicals, then into the bile ducts and finally into the duodenum. The bile can be easily obstructed in its flow since it is secreted under very low pressure. Within the intestinal tract the bilirubin is altered through the action of bacteria into a reduced substance, urobilinogen. Part of this urobilinogen may be changed into urobilin and excreted through the feces as such (hydrobilirubin, stercobilin) along with a trace of urobilinogen. A portion of the urobilinogen is reabsorbed into the portal vein and carried back to the liver, where normally it is reconverted into bilirubin (and hemoglobin?) and again excreted.

CHART 1



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*Presented before the Hennepin County Medical Society, Minneapolis, March 30, 1932.

Normally the urine contains no urobilinogen, but may contain a trace of urobilin. Figure 1 shows a sketch of a portion of the liver lobule after MacNee. This sketch tries to present the polyhedral parenchymal cells of the liver arranged in structures resembling test tubes with the open ends emptying into the bile duct. Along the cords of these liver cells run the liver capillaries or sinuses lined by reticuloendothelial cells, the so-called Kupffer cells. The blood from the portal vein runs through these sinuses and empties into the central hepatic veins.

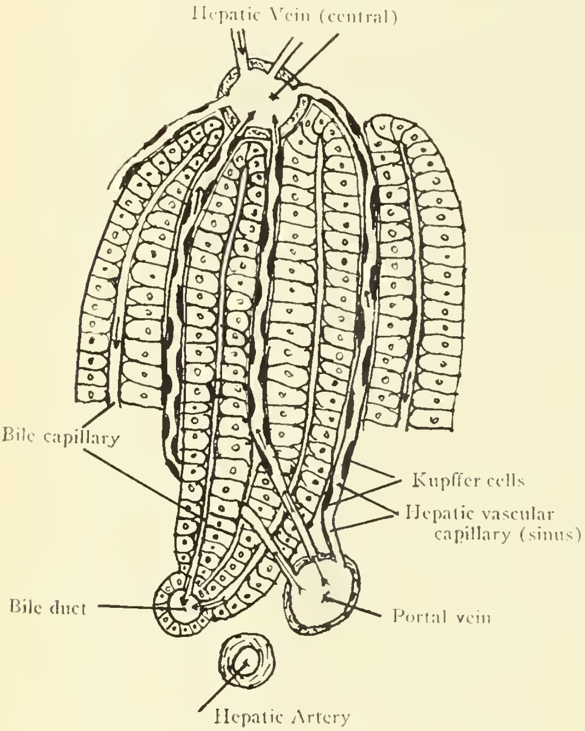

Fig. 1. Diagram of section of liver lobule (after McNee).

Bearing this picture in mind, the three types of jaundice may be visualized in the following manner: If there is some obstruction to the outflow of the bile in any portion of the bile ducts or even in the minute biliary radicals, the bile secreted by the parenchymal cells will be forced into the general circulation and thus result in *obstructive* jaundice. It should be noted that in this type of jaundice the bilirubin that is carried in the portal vein or that which is formed within the Kupffer cells has been first taken up by the liver cells and excreted normally into the biliary system, but owing to the obstruction lower down it has been forced back into the systemic circulation. This type of jaundice is produced by bilirubin which when tested with the van den Bergh reagent gives a characteristic reaction which is known as the *direct immediate* reaction.

A second type of jaundice may be produced by an excess of bilirubin circulating through the blood of the portal system as a result of increased hemolysis or destruction of the red blood cells. This excess of bilirubin as it is carried through the liver capillaries may be present in amounts in excess of what the parenchymal cells of the liver normally are capable of taking up and excreting into the bile radicals. That part which is taken up by the liver cells and excreted will reach the intestine and may be present there in normal or often in excessive amounts. However, that portion of the bilirubin in excess of the functional ability of the polyhedral cells which cannot be taken up by the liver cells will pass on into the blood of the hepatic vein and thus into the general circulation. This type of jaundice will therefore be produced by bile which did not pass through the parenchymal cells of the liver. Such bile seems to have characteristic properties in that it does not give the *direct immediate* van den Bergh test, but gives the direct *delayed*, and especially the *indirect* van den Bergh test. It is this type of jaundice that comprises the group classified as hemolytic jaundice. It must be borne in mind that the excessive hemolysis in this type of jaundice occurs through the activity of the reticuloendothelial system itself and not through the intervention of certain bacteria, parasites, toxins or poisons circulating in the blood stream, such as hemolytic streptococci, B. Welchii, or malarial parasites.

The third type of jaundice may be produced by factors in which there is neither excessive destruction of red blood cells by the reticuloendothelial system, nor is there definite obstruction to the outflow of bile through the biliary system into the intestine. This type of jaundice is the result of alterations—degenerative changes—which affect the parenchymal cells of the liver plus in some cases hemolysis of the red blood cells within the blood stream through the action of the bacteria and their toxins or metallic and other poisons. Such jaundice is known as toxic or infectious jaundice. The toxins from certain bacteria or other infectious agents or the toxic effects of certain metallic poisons such as arsenic, phosphorus, chloroform, and the like produce this type of jaundice. As a rule such jaundice is not simple in its pathogenesis, since at the same time that the degenerative changes are produced in the liver cells some cells may become swollen to such a degree that they compress and obstruct different levels of the biliary radicals so that in addition to the disturbed functional activity of the polyhedral cells in excreting the bilirubin there is added an intrahepatic obstructive factor. This type of jaundice is therefore characterized by both a biphasic van den Bergh reaction as well as an immediate direct positive test. The biphasic van den Bergh is generally interpreted as indicative of hepatic damage involving the polygonal cells. Unfortunately this reaction occurs too frequently to be of great diagnostic importance.

In order to better understand the significance of jaundice it might be well to consider the amounts of bilirubin normally present in the blood serum. The amount of bilirubin may be measured in one of several ways. The icterus index is a measure of the bilirubin in the serum arrived at by comparing the color of the serum with a standard solution of potassium bichromate and reading off directly in the colorimeter the intensity of the yellowish color. Normally the icterus index is from 4 to 6. Between 6 and 16 lies the zone of latent jaundice, in which there is a definite increase above the normal of bilirubin in the serum but not sufficient to produce noticeable pigmentation of the skin or mucous membranes. Above 16 there is usually visible jaundice present. Another standard for comparison is the quantitative bilirubin estimation. This is generally done by means of the van den Bergh test. In this test the standard for comparison is the azobilirubin solution and we obtain quantitatively the amount of bilirubin per volume of blood. Normally there is less than .5 mgm. in 100 c.c. of blood, which means less than one part in 200,000. This figure, 1 to 200,000, or .5 mgm. per 100 c.c., is considered one unit. Normal blood contains from .2 to .5 units. Generally when bilirubin is present in amounts greater than four units, jaundice develops.

From what has been stated above it is therefore obvious that jaundice is the result of increased amounts of bile pigment circulating in the blood, hyperbilirubinemia, and that this hyperbilirubinemia may result from one of three conditions mentioned, namely: (1) increased destruction of red blood cells: hemolytic jaundice; (2) damage to the polygonal (excretory) cells of the liver: toxic or infectious jaundice (often combined with more or less of the intrahepatic obstructive jaundice); (3) interference to the outflow of bile: obstructive jaundice. Chart 2 considers briefly the main characteristics of the different types of jaundice for differential diagnosis.

CHART 2

JAUNDICE

I. Hemolytic Jaundice.
  1. Congenital, familial, acholuric jaundice.
  2. Acquired hemolytic jaundice.
  3. Pernicious anemia.
  4. Banti's disease.
  Note: Stools, normal or darker; urine, urobilin(ogen) but no bile.
  Increased fragility of cells in (1).
  No itching of skin (no increase in bile salt retention)
  Positive *indirect* van den Bergh.

II. Toxic or Infectious (Parenchymatous) Jaundice.
  1. Acute catarrhal jaundice.
  2. Acute and subacute yellow atrophy.
  3. Infectious spirochetal jaundice, yellow fever.
  4. Toxemias of pregnancy.
  5. Biliary liver cirrhosis.
  6. Luetic hepatitis.
  7. Arsenic, phosphorus, choloform poisoning.
  8. Pneumonia, congestive heart failure.
  Note: Stools, normal or lighter; urine, urobilin(ogen) and bile.
  Positive *direct* and *biphasic* van den Bergh.

III. Obstructive Jaundice.
  1. Cholelithiasis (parasites)
  2. Tumors, in or compressing ductus choledochus.
  3. Chronic pancreatitis.
  4. Carcinoma in head of pancreas.
  5. Inflammatory swelling of m.m. of ducts (intrahepatic obstruction)
  Note: Stools, clay-colored (when complete)
  Urine, bile and bile salts but no urobilin(ogen).
  Positive immediate direct van den Bergh.
  Itching of skin, bradycardia.
    Extrahepatic obstruction: colicky pain and clay-colored stools common. Liver not often enlarged or tender. Urine, bile, no urobilin(ogen).
    Intrahepatic obstruction: liver often enlarged and tender. Colicky pain uncommon. Stools normal to clay-colored. Urine, bile and urobilin(ogen).

IV. Dissociated Jaundice (rare).
  Isolated retention of either bilirubin or bile salts.
  Retention of bile salts alone, very rare.
  (May explain a few rare cases of idiopathic severe itching.)

REPORT OF CASE

Mr. H. H. D., aged twenty-eight, married, was first seen March 14, 1932, complaining of jaundice continuously for the past twenty years, an enlarged spleen of twenty years' duration, attacks of loss of appetite and vomiting, with distress and pain in the right hypochondrium. His family history is entirely negative. He is an only child. There is no history of jaundice in any members of the family as far as he knows. He had measles as a child, whooping cough and scarlet fever at 7 years, typhoid fever at 8 years, mumps at 18. He has had no operations or injuries. He was told early in childhood that he had a weak heart. His appetite is generally poor, he is constipated most of the time, voids five or six times during the day, but has no nocturia. His urine is generally dark amber in color. His habits are very good, he exercises moderately, but has been afraid to exercise strenuously because he was told at the onset of the jaundice that he should lead a sedentary life. He smokes moderately and uses no alcohol. He was fairly well up to the age of eight, when he developed typhoid fever. This ran a rather severe course of about six weeks, but he made a complete and uneventful recovery. Several months later jaundice appeared. At the same time the spleen was found to be enlarged. He developed a moderate constipation. The spleen continued to enlarge for some time. During the past twenty years he has been continuously jaundiced but at times the color would be lighter and at other times much darker. Generally during the summer months he seems to bleach out, and turn darker in the winter. He becomes perceptibly darker after an acute illness such as a cold. In spite of the jaundice he has remained in fairly good health; he has been "more jaundiced than sick." He has had no itching of the skin at any time. About December 10, 1931, he developed pain in the gallbladder region. This was thought to be due to either appendicitis, gallbladder disease or ulcer. He was given the dye for a cholecystogram but was unable to retain it and no gallbladder X-rays were taken. About March 1 he developed another attack of discomfort in the right hypochondrium with nausea but no definite colicky cramps. He has again lost his appetite and has lost a few pounds in weight.

On physical examination his height is five feet, seven inches, weight 120 pounds (maximum 127), pulse 100, blood pressure 108/78, jaundice about Grade 2, a little more intense in the conjunctivæ. His sinuses and throat are clear and there is no adenopathy. There is a marked lordosis in the mid-dorsal region towards the right, the right chest appearing more prominent. The heart and lungs are normal; abdomen is soft, the liver extends just below the costal margin, and there is some tenderness in the gallbladder region. The spleen is markedly enlarged, extends 9 cm. below the costal margin and about 13 cm. above, so that its dullness measures about 22 cm. in length and 14 cm. in width; it is not tender. The reflexes are all very sluggish. The Wassermann test is negative, the blood shows 83 per cent hemoglobin, 5,200,000 reds, 9,100 leukocytes, of which 56 per cent are polymorphonuclears, 40 per cent lymphocytes, 2 per cent transitionals, 1 per cent eosinophiles, 1 per cent basophiles. The striking picture in the blood slides is the pronounced almost uniform microcytosis. All the cells are deep staining. The reticulocyte count was 7.1 per cent. The urine was dark amber, specific gravity 1.026, entirely negative except for urobilinogen 4 plus. Careful tests for bilirubin were entirely negative. The blood showed an icterus index of 100 with a quantitative test of 83 parts of per million. The direct immediate van den Bergh test showed a very faint trace (practically negative), the direct delayed was strongly positive, the indirect reaction 4 plus. The fragility test was not entirely satisfactory. Hemolysis was marked in .50 per cent sodium chloride and was complete in .32 per cent. The normal showed beginning hemolysis at .42, and complete at .30 per cent. The hemolysis in this case undoubtedly began much above .5 per cent so that the fragility was definitely increased. A cholecystogram taken following the ingestion of kerasol capsules showed a non-functioning gallbladder.

This patient shows extremely interesting findings: jaundice that has persisted for twenty years without the usual symptoms of jaundice, during which time the patient has been more icteric than sick; a pronounced splenomegaly; a blood picture which shows a definite microcytosis with an increased reticulocyte count, a definite increase in the fragility of the red blood cells; an enormous hyperbilirubinemia (approximately twenty times the normal, and yet no bilirubin in the urine. It is quite obvious that this patient presents a classical picture, complete in almost every detail, of congenital hemolytic jaundice (Chart 3). Charts 2 and 3 present in outline form the characteristics for differential diagnosis between the different types of jaundice. One of the most striking findings in this case is the enormous hyperbilirubinemia without any bilirubinuria. This finding is obviously not in accord with the view of those who question the importance of the van den Bergh test for differential diagnosis. In obstructive jaundice where the van den Bergh test gives a direct immediate positive, an accumulation of bilirubin in the blood to a point above the icterus index of 15, or in excess of three to five parts per million, always presents bilirubin in the urine. From this it would follow that the renal threshold for the obstructive type of bilirubin is low. In the case under discussion, the bilirubin gave the enormous icterus index of 100 and a quantitative test of 83 parts per million without showing the slightest trace of bilirubin in the urine.

CHART 3

CONGENITAL HEMOLYTIC (ACHOLURIC) JAUNDICE

1. Jaundice. "More icteric than sick."
2. Splenomegaly.
3. Enlarged liver ±. Gallbladder disease and gallstones common (60 per cent).
4. Anemia ±, secondary type. *Microcytosis.*
5. *Fragility* of erythrocytes increased ++. (Hemolysis in hypotonic salt solution)

	Begins	Complete
Normal	.42 per cent	.30 per cent
Cong. Hem. Jaund.	.60–.70 per cent	.35–.40 per cent

6. Blood Serum.
   "Indirect" bilirubin excessive up to 85 per mil. Normal 3–5.
   Icteric index to 100. Normal 4–6.
   Renal threshold to indirect bilirubin very high ∴ acholuric, no bile in the urine.
   van den Bergh—direct immediate negative
   direct delayed positive
   indirect positive 4+
7. Absence of "jaundice" symptoms (itching, bradycardia).
8. *No* bilirubinuria. Excessive urobilinogen and urobilin in urine and feces.
   (Obstructive jaundice from complicating gallstones may, though rarely, confuse the picture).
9. Reticulocytes (reticulated reds), 5–35 per cent (Normal 1 per cent).

Several explanations have been offered for this peculiar property. As the bilirubin is formed and passes into the blood stream, it is adsorbed by some constituent of the plasma or blood serum. This combination through adsorption is fairly stable and results in the bilirubin becoming more resistant to oxidation, less susceptible to excretion through the kidneys, and prevents it from reacting immediately to the van den Bergh diazo test. Such a concept helps explain some of the findings in congenital hemolytic jaundice such as the acholuria in spite of deep jaundice, and the indirect van den Bergh test. Substances which tend to lower the surface tension of the serum, as for example an increased concentration of the bile salts as found in obstructive jaundice, lessens this binding of the bilirubin to some serum constituent, and the unbound bilirubin will therefore be more readily excreted by the kidneys and it will give the direct immediate van den Bergh test. Another explanation offered is the assumption that the bilirubin as it comes to the liver is altered somehow in its passage through the polyhedral cells of the liver and thereby its properties are modified. Hans Eppinger assumes that the large quantities of urobilin and urobilinogen circulating in the blood of cases of hemolytic jaundice affect the kidney parenchyma so that its threshold to bilirubin becomes high. The first explanation seems to be the more tenable, especially since the work of E. S. G. Barron,[1] who showed that the bilirubin which gives the direct reaction when added to normal serum in concentrations up to 12 mgm. per cent, ceases giving the direct immediate reaction and gives only the indirect one. When the concentration is raised above 16 mgm. per cent, reaching a point apparently in excess of the saturation point of the adsorbing substance, the direct reaction again returns.

As to the pathogenesis of hemolytic icterus, little is known. The principal process is a tremendous destruction of the red blood cells in the body. It is often familial in type so that several members of the same family have the disease. The spleen apparently plays an important part in the production of the symptoms and the findings, but is not in itself the primary cause. There is generally present an excessive production of red blood cells in the bone marrow as a result of the over-destruction of these cells. This is apparent from the marked increase in the young immature forms, the reticulated reds in the circulating blood. In some cases the reticulocytes number 35 per cent or more of the total cell count. The blood cells themselves apparently are not normal through some dyscrasia of the hematopoietic system. This is evident from the increase in the fragility of the red blood cells, one of the most characteristic features in this disease. That the spleen is not *the* causative factor of the disease is seen by the fact that after splenectomy, although the patient seems to make a good clinical recovery, with the jaundice clearing up and the general health improving, the two important findings in the blood, the microcytosis and the increased fragility of the red blood cells, usually remain unchanged. With the disappearance of the icterus after splenectomy the bilirubinemia approaches the normal, the cell count approaches the normal, and the blood picture in general outside of the two characteristics just mentioned, becomes apparently normal. A frequent complication of this disease is cholecystitis with cholelithiasis. Statistics show that about 60 per cent of the cases of hemolytic jaundice sooner or later develop gallbladder disease. This is explained partly by the increased viscidity of the bile as a result of the increased bilirubinemia. Occasionally the typical picture may therefore be obscured by a complication of true gallbladder disease. The one feature which was absent in the case here studied was anemia; the hemoglobin and red count were practically normal, but as aforementioned, this disease has exacerbations and remissions. During the period of greater activity in the destruction of the red blood cells the anemia becomes more pronounced, while between periods the hemoglobin may become quite normal.

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[1] Barron: E. S. G., Bilirubinemia. Medicine, 10:77, 1931.

SUMMARY AND CONCLUSIONS

1. Hyperbilirubinemia and jaundice result from a large variety of conditions and may form important findings for diagnosis.
2. The laboratory data, together with the history and clinical findings, permit the types of jaundice to fall pathogenetically into three fairly well defined groups: (1) obstructive jaundice; (2) toxic and infectious jaundice; and (3) hemolytic jaundice.
3. The van den Bergh test presents a definite advance in the study of jaundice, and is often of considerable aid in differentiating the several types.
4. The renal threshold of bilirubin in hemolytic jaundice is very considerably higher than that in obstructive jaundice.
5. The main characteristics of the different types of jaundice are briefly outlined in the present study for differential diagnosis.
6. An interesting case of congenital hemolytic (acholuric) jaundice is here reported.

Note.—After the completion of this paper the patient was operated on April 20, 1932, after several days of hospitalization for the purpose of reducing the bleeding and clotting time. The bleeding time was reduced from eleven to four minutes and the clotting time from fourteen to six minutes. The spleen was found large and adherent to the contiguous structures, making its removal somewhat difficult. The capsule was tense and rough and was mottled with grayish intersecting streaks and nodules of a chronic perisplenitis. It weighed 1,540 grams immediately after removal and measured 22.5 by 15 by 7.5 cm. An hour later, after a quantity of blood oozed out of the organ, it weighed only 1,180 grams, showing a loss of 360 grams of blood, which easily escaped. This gives an idea of the enormous blood content of such an organ during life, since it lost without pressure an amount equal to three times the average normal size of the spleen. The gallbladder was found definitely thickened from a chronic cholecystitis but there were no gallstones present and it was therefore not disturbed at the operation. On this date (April 25) patient is making a rapid and uneventful recovery.

TREATMENT OF HEAD AND SPINE INJURIES*

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In the care of severe head injuries, it is most important that early and efficient treatment be instituted so the patient may have the greatest possible opportunity of surviving with the least possible mental disability. The early treatment must be directed toward preventing death within the first few hours from pressure on the cardiac, respiratory, and vasomotor centers at the base of the brain. Early treatment must also be directed toward relieving the pressure on the cortex of the cerebrum and cerebellum in order that motion, sensation, intelligence, memory, and judgment may remain unimpaired so the individual may maintain his economic and social state.

In treating head injuries, skull fracture is of much less importance than the damage done to the enclosed brain and its coverings. While extensive fractures of the skull usually are accompanied by severe damage to the enclosed structures, there are, on the other hand, many cases of serious intracranial injury where the X-ray is negative for fracture. These cases may cause a false sense of security with an underestimation of the seriousness of the intracranial damage.

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*Read before the Ramsey County Medical Society on March 28, 1932.

leading to inadequate treatment, resulting in sequelæ which may be permanently crippling. On the other hand we may have definite extensive fractures, especially of the vault of the skull, demonstrated by X-ray, with little or no intracranial damage.

Fractures of the skull may be classified under various headings, but for practical purposes there are three important types:

1. Depressed fractures of the vault.
2. A depressed fracture complicating a scalp wound.
3. Fractures of the base which extend through the external auditory meatus or through the nasal passages and sinuses.

In compound fractures of the vault, when the tissues of the scalp have been lacerated, contused and contaminated, debridement is important. When in addition the dura has been torn, the subarachnoid space and the brain exposed, thorough and prompt debridement is our best means of combating meningitis and death.

If there is a probability that infection can be avoided, the fragments in a compound comminuted fracture should not be removed. If left in the wound, the fragments will heal in; if they are removed the patient will recover with a cranial defect. A cranial defect exposes the brain to trauma by removing a part of its bony covering. This is a more serious condition in the vault of the skull than in the temporal regions. A cranial defect will have a detrimental psychologic effect on the individual, in addition to which it would be a great handicap in securing employment. Indentations of the skull without depressed spicules should be left alone. Fragments of bone depressed below the level of the surrounding margins should be elevated. This is especially important in the motor areas. No operation should be undertaken until the patient has recovered from shock. A systolic blood pressure of 60 with subnormal temperature should be considered a degree of shock contraindicating surgery except for arrest of hemorrhage.

In compound fractures of the base of the skull with communication through the auditory canal, the canal should be dried with sterile applicators, swabbed with an antiseptic solution, and a sterile dressing applied to absorb the escaping blood and cerebrospinal fluid. The auditory canal must not be irrigated, as this will force infection through the fracture opening into the cranial cavity.

Fractures into the nasal passages and sinuses are a grave source of meningitis. Because of our inability to disinfect the nares, the danger of infection extending through the line of fracture is very real. Many of these patients have, either before or after coming under the care of their medical attendant, tried to clear the nose of mucus, blood, and cerebrospinal fluid by blowing, which has forced infected material and air through the fracture opening into the subdural space. To prevent meningitis developing from this source, the patient, if conscious, should be promptly instructed to "not blow his nose." The nares should be cleaned by suction or sterile swabs, after which antiseptic solutions may be applied by swabs. Sprays, atomizers, or irrigations must never be used.

In severe intracranial injuries there is a marked increase in the intracranial pressure due to an increase in the amount of the cerebrospinal fluid, to edema of the brain and medulla, or to intracranial hemorrhage. As the brain is enclosed in an unyielding bony cavity, the increased amount of cerebrospinal fluid, edema, and hemorrhagic clots will compress the capillaries in the brain, thereby depriving them of blood and its contained oxygen. The strangulation of the cells in the cortex will cause unconsciousness, and, if not relieved and the patient survives, the delicate cells in the cortex will atrophy, resulting in more or less permanent damage to brain function. If the intracranial pressure is not relieved, there is grave danger that it will extend to the so-called "vital centers" in the base of the brain and cause death by pressure on the vasomotor, respiratory, and cardiac centers located there. For the above reasons it is extremely important to relieve the increased intracranial pressure early and to keep it within safe limits if possible by the following methods:

1. The intravenous injection of 50 c.c. of a 50 per cent solution of glucose. This may be repeated one or more times in each twenty-four hours if indicated.
2. Magnesium sulphate should be given by mouth, duodenal tube, and rectum.
3. Withdrawal of cerebrospinal fluid by lumbar puncture. A manometer should be used and the withdrawal stopped when the pressure reaches normal. Ten mm. of mercury is a normal pressure; 10 to 20 mm. is a moderate increase; 20 mm. or over is a marked increase.

The spinal drainage may be repeated every few hours in extreme cases if the fluid is under increased pressure. Hemorrhagic spinal fluid is irritating to the meninges. Its removal tends to reduce post-traumatic sequelæ.

4. The head of the bed should be elevated.

5. Fluids should be restricted to a total fluid intake of 600 to 1,000 c.c. each twenty-four hours during the first few days. The water intake should not exceed 1,200 c.c. during the first few weeks. If more fluids are given, there will be an increase in the amount of cerebrospinal fluid and brain edema. The patient should be placed on a diet of solid dry food.

Subtemporal decompression was extensively employed at one time, but its use has gradually decreased during the past few years except as a measure of last resort in selected cases.

In the occasional selected case in which hypertonic solutions and spinal drainage are insufficient to control the increased intracranial pressure, a bilateral subtemporal decompression may be undertaken if the patient has survived a few hours. After the dura is opened, any fluid or blood present can be evacuated and a soft drain inserted under the brain. If only edema is present, no drain should be used. Edema and hemorrhage compressing the medulla are but little benefited by subtemporal decompression. Fractures involving the anterior and middle fossæ are benefited by decompression. Recovery depends on the amount of associated brain damage.

Patients who have suffered very severe and extensive laceration and contusion of the brain and who from the beginning have a rapid pulse, cyanosis, stertorous breathing with rapidly rising temperature are hopeless and die within a few hours regardless of what treatment is instituted.

Dr. Walter E. Dandy in a recent article maintains that in the presence of extradural hemorrhage the brain holds the dura against the blood clot, acting as a tampon. If the intracranial pressure is reduced by lumbar puncture or the intravenous injection of hypertonic solutions, the dura pulls away, allowing the vessels to again open and bleed. In cases of extradural hemorrhage with increased intracranial pressure and no blood in the spinal fluid, prompt operation is indicated. The clot should be localized, if possible, by neurologic symptoms and not by the location of the external contusion.

In selected cases it is safer to explore not by an osteoplastic flap but by one, two, or three trephine openings along the fissure of Rolando. If an extradural clot is found, the opening can be enlarged, the clot evacuated, and hemostasis effected.

In severe cerebral contusion or laceration with symptoms of cortical irritation and the presence of blood in the cerebrospinal fluid with prolonged unconsciousness, it may be assumed that a subdural hematoma is present. A fixed dilated pupil usually indicates a brain lesion and hemorrhage on the same side of the cortex. If there are localizing signs such as paralysis, twitchings, and convulsive seizures, an exploration should be considered if the patient recovers from the shock. Absolute rest in bed for three weeks in mild cases and six weeks in severe cases is a most important rule to follow in cases of head injuries.

In about 10 per cent of the cases of head trauma, the mortality rate and the permanent disability will in the future be reduced by our ability to diagnose, locate, and operate the cases of extensive intracranial hemorrhage.

SPINE INJURIES

The majority of back injuries are of relatively slight importance and recover in a few days. The major portion of such back injuries occur in the lumbo-dorsal and lumbo-sacral regions.

Very often no serious effort is made to differentiate between muscular ligamentous strains and fractures of the vertebræ. As the damaged structures of the vertebral column are so deeply situated, there may be no objective evidence of trauma. Limitation of motion is a constant sign, and all such cases should have X-ray films taken before a diagnosis is made. Some patients with fractured vertebræ may have little pain. In the absence of neurologic symptoms, fractures can only be differentiated from strains by antero-posterior and lateral X-ray plates.

Ligamentous strains are produced by overstretching of the spinal column, external violence, or sudden severe muscle pull. If there is no accompanying muscle trauma, the muscles may splint the injured area while the patient remains quiet, thereby relieving him of pain. The pain of ligamentous rupture is usually deep seated and is aggravated by movements of the spine.

Muscle strains show tenderness to pressure and to all movements in which the injured muscles participate. Active or passive movements in the direction of the injured muscles will be relatively free from pain. Muscle strains should be immobilized for about two weeks or until the acute symptoms have subsided. Heat, light massage, and gradually increasing active exercise should then be used. Severe ligamentous strains require immobilization of from two to four weeks, after which a removable cast or spinal brace should be worn, which should be removed daily for physical therapy and exercises. If the involuntary rigidity and lameness are increased by exercise and manipulation they should be discontinued until later, and only heat, diathermy, and light massage employed.

In fracture of a spinous process there is no injury to the cord or nerve roots. In fracture of the transverse processes the roots of the nerves may be damaged. Fracture of the articular processes are common in association with dislocations of the vertebræ. The nerve roots may be damaged. In fractures of the arches the cord is often damaged.

Fractures and dislocations of the spine are important because of its dual functions of supporting the trunk and protecting the spinal cord. The spinal cord may be crushed, torn, or compressed by a dislocated vertebra or a fractured arch. An extradural hemorrhage, a subdural hemorrhage, or hemorrhage into the substance of the cord may cause injury. When the cord has been completely severed by the injury it is beyond repair. When the cord has been damaged by pressure, function will return when the pressure is relieved, by removing a compressing bone or by the removal or absorption of a blood clot.

Before undertaking treatment, a careful history should be taken. A neurological examination should include spinal puncture with examination of the spinal fluid for blood, and the determination as to whether or not spinal block is present.

Dislocated vertebræ are usually also fractured, although dislocation may occur in the cervical region without fracture. The patient should be moved and examined with great care, as sudden death may occur from pressure on the cord. Dislocations may occur with or without cord injury. There is less danger of further injury to the cord if the patient is transported in the face-down position. Forward dislocation of the upper articular facets on one side in the cervical region is characterized by the head being held rigidly in a cocked, partly flexed position. It is bent toward the side of the injury and the chin is turned away from the injury with or without paralysis of the cord. In bilateral dislocation the cord is more likely to be damaged. An X-ray may show no displacement because the body of the vertebræ, though dislocated at the time of the accident, returned spontaneously to the normal position. In dislocations the ligaments are either torn or stretched, permitting overriding of the articular facets. If dislocation of one-half inch or more occurs in any of the four upper cervical vertebræ, death usually ensues.

Cervical dislocations with or without fractures can often be reduced by placing the patient on a bed made firm with boards placed under the spring. A head suspension sling from under the chin and occiput is fastened to the head of the bed. The head of the bed is then elevated twenty to thirty inches. A suitable pillow is placed under the kyphosis. In this manner the patient is hung by his head, and his body becomes the counter-extension. This extension may effect a reduction in from one to twenty-four hours.

Reduction may be accomplished under general anesthesia by the application of manual traction with slight exaggeration of the deformity, while the head and upper cervical spine are being manipulated into normal position. The head must not be flexed during the manipulations, in order to avoid damage to the cord.

In the event of the failure of either of these maneuvers, laminectomy should be resorted to in selected cases. After reduction the head is supported in a plaster cast or leather collar for from two to four months.

The skin must be carefully watched as pressure sores easily occur on the anesthetic skin. Turning and moving the patient frequently to relieve skin pressure is important. An air cushion under the pelvis, cotton rings under the heels, and a cradle over the extremities to prevent the pressure of the covers will aid in preventing the development of bed sores. Foot drop should be prevented by suitable supports. In all cases of complete paralysis, a permanent catheter should be introduced into the bladder and the bladder irrigated twice a day. Some urinary antiseptic should also be given. All cases of complete rupture of the spinal cord sooner or later develop bed sores and an inflammation of the genito-urinary tract develops regardless of all precautions.

Fractures of the spine are most common in the dorso-lumbar region. This is the weakest point in the spine because it is where the dorsal and lumbar curves reverse. When a spine is forcibly flexed from end to end, the body of one of the vertebræ at the dorso-lumbar region becomes crushed so the vertebral body becomes wedge-shaped. This causes a kyphosis. In these compression fractures the patient should be placed in bed with the lumbar spine supported. As the spasm diminishes, the support under the spine should be increased. A convenient way of securing hyperextension is to place the patient in a modern hospital bed with the patient's head at the foot of the bed. By elevating the knee-elevating mechanism of the bed, the kyphosis can be corrected and hyperextension obtained to any degree desired. With a tall patient a seven foot bed is required.

A plaster-of-Paris jacket with adequate over-correction of the kyphosis is the most satisfactory method of treating compressed fractures of the vertebral bodies. To secure sufficient over-correction while applying the cast, the patient should be placed on a fracture table, the back overextended and supported by a muslin bandage attached to the overhead bar on the fracture table. The plaster jacket should be applied from the suprasternal notch to below the iliac crests. Another method of securing a reduction of the kyphosis and over-extension of the spine is to support the patient in a face-down position by suspending the feet and shoulders to an overhead frame or hooks in the ceiling while applying the plaster jacket. In a compressed fracture it is usually impossible to secure a complete reduction of the crushed vertebral body, but the extension will prevent further compression and will diminish or correct the deformity. The plaster jacket should be worn for two to three months, when it may be removed and a steel supporting brace substituted. The patient may resume light work in six months to one year after the injury. If weakness or nerve root pains remain after a period of six months, an Albee or Hibbs operation may be performed to strengthen the spine.

Falls on the buttock with acute flexion of the upper part of the body may result in fractures with dislocation in the lumbar vertebræ. Fractures and dislocations of the lumbar vertebræ are the least serious of all spinal fractures because the injury is not to the cord proper but to the spinal roots of the cauda equina. They are more resistant and if the pressure is removed by laminectomy, recovery is more likely to occur. If a patient does not recover after an injury to the lumbar region of the spine, a laminectomy may prove of value as long as a year or more after an injury.

When there is cord pressure from dislocated or fractured vertebræ which cannot be relieved by extension, position, or manipulation, or where there is strong suspicion of cord pressure from a blood clot, laminectomy should be performed after the patient has recovered from shock. Although there is disagreement as to the advisability of doing laminectomy in cases of paralysis due to fracture and dislocation of the spine, occasionally an apparently hopeless case will be benefited. The greatest benefit from laminectomy will result in those cases in which there is some neurological evidence that the cord has not been entirely severed.

THE DEVELOPMENT OF TRANSURETHRAL PROSTATIC RESECTION*

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THE lumen of the male urethra is comparatively small, averaging but 0.75 cm. in diameter. Although the prostatic urethra is one of the larger portions, it is not capable of much greater dilatation than 1 cm. without undue trauma. Hence it does not require a great amount of tissue partially to obstruct it; even 1 or 2 gm. of hypertrophic prostatic tissue, in certain situations, can produce as complete obstruction as a cork in the neck of a bottle. Yet the prostatic urethra is comparatively accessible from without, and the most thorough visual examination is possible. Appreciating this accessibility, and the small amount of hypertrophic tissue capable of obstructing it, urologists have attempted to relieve the obstruction by transurethral means, even before instruments for its visual examination were perfected.

The first of these attempts was made by Guthrie, in 1834, who incised the vesical orifice with a concealed blade in a catheter, and described the procedure as "division of the bar at the neck of the bladder," thus introducing the term "median bar" into urologic literature. His procedure was identical with that carried on today with Collings' excellent instrument, with the exception that whereas Guthrie had to work entirely by feel, electricity and the perfection of lenses permit his successors to work with the operative field in full vision. Instead of the concealed knife blade of one hundred years ago, the surgeon now uses a radio knife and so encounters less bleeding. The results of the two procedures are identical: After the scarred, contracted neck of the bladder is incised, the urine flows more freely. No tissue is removed, or at best, an insignificant amount. The procedure is not intended for the correction of adenomatous hypertrophy or any other form of obstruction that requires removal of an appreciable amount of tissue. It is best described as transurethral prostatic incision, or sphincterotomy. When properly applied, the relief given is immediate and complete.

Mercier, in 1837, realizing that such cases represented but a small portion of those in which there is urinary obstruction in the prostatic urethra, devised an instrument that would not only cut the bar but actually remove tissue from it. This consisted of a tubular knife in a tubular sheath in the side of which a window had been cut. As there was no provision for control of bleeding, and as the operation had to be done entirely by feel, its application was limited.

Bottini, in 1873, endeavored to widen the application of the Mercier instrument through the better control of bleeding by substituting a galvanocautery for the knife, but the necessity of carrying the procedure on blindly still limited its application, for the operator could never be quite sure that he was burning the hypertrophied prostate gland and not the bladder itself. Moreover, the new cautery did not permit of the removal of any tissue, but simply its destruction by burning, a method which, of course, left much eschar and hence extreme secondary infection and sepsis.

Freudenberg, in 1897, added still more refinements so that the danger of the instrument slipping away from the prostatic urethra and burning the wall of the bladder was minimized, and for a time it was in quite general use. However, the procedure had to be carried on by feel rather than by vision, and its failure to remove any tissue except by its destruction through burning was a decided handicap. Satisfactory functional results following its use were the exception instead of the rule. During this same period suprapubic and perineal prostatectomy were coming into vogue. Van Dittel, in 1885, by resecting a portion of a large middle lobe in the course of exploratory cystostomy, presumably for stone, relieved the patient of urinary obstruction. Following this report, Belfield in America and McGill in England reported several cases of partial suprapubic prostatectomy followed by good functional results, a procedure which assured relief as long as the obstruction was due to the intravesical part of the hypertrophied gland but was naturally doomed to failure in cases in which the obstruction was intra-urethral and not visible from the bladder. Belfield's first patient, operated on in 1886, was described by him as having a median tumor "as large as an almond." This was twisted off; the patient recovered and thereafter was free from difficulty in urinating and from residual urine, demonstrating that the position of the obstructing tissue, not the size of the prostatic hypertrophy, determined the amount of obstruction produced. Unfortunately, this fact was not sufficiently appreciated, and when failures occurred following partial prostatectomy because of the unseen urethral obstruction which remained, the leading surgeons decided to attempt the removal of the entire gland. Fuller did the pioneering in America, and in England Freyer popularized the method, and as all obstruction was removed together with the gland, the functional results were, as a group, far superior to those following partial removal or transurethral methods. With few notable exceptions the endeavor of the urologic surgeon since that time has been to lower the mortality of prostatectomy rather than to devise some new method for removing simply the portion of the gland that obstructs. This effort to reduce the mortality associated with prostatectomy has been markedly successful, but the fact cannot be overlooked that the operation still carries a greater risk than any other surgical procedure undertaken for the correction of a benign condition. Furthermore, the functional results are not invariably good, and therefore a few dissatisfied urologists have endeavored to perfect the transurethral method of treatment.

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*From the Section on Urology, The Mayo Clinic, Rochester, Minnesota. Submitted for publication February 4, 1932.

The first of these efforts was the presentation by Young, in 1911, of his punch. This instrument resembled Mercier's, but had the added advantage that by reflected light the portion of the prostate gland to be removed could be seen projecting into the lumen of the instrument. Braasch, in 1918, added still further to the visualization of the procedure by modifying his cystoscope so that it could be used as a punch and, being open at the distal end, the entire operative field was visualized both before and after engaging the tissue to be excised. Neither instrument provided any means of hemostasis and so was of limited application, for until this problem was solved large amounts of tissue could not be removed. Caulk, in 1920, modified the Young instrument, much as Bottini had the Mercier instrument, by substituting a cautery blade for the tubular knife, but in Caulk's instrument the tissue was removed rather than destroyed in situ. This method, by reducing bleeding, made it possible to remove greater amounts of tissue than before, and, although adequate vision was not possible with the instrument, Caulk deserves great credit for keeping before the profession the possibility of correcting prostatic obstruction by removing simply the obstructing portion of the gland instead of subjecting all patients to a major surgical procedure to remove in most cases insignificant amounts of tissue easily accessible through the urethra.

I used Caulk's instrument in eighty-seven cases but since it was not possible to see the tissue to be excised until it had been blindly engaged by feel, I modified Braasch's instrument so that larger amounts of tissue could be removed and the bleeding could be controlled by electrocoagulation of the cut surface with a Bugbee electrode. In 1928, Stern of New York developed a lens instrument which excised the obstructing tissue in the posterior urethra with a wire loop electrode through which a high frequency current, much as is employed in the radiothermy knife, was used.

The instrument gave complete vision of the operative field and the high frequency current reduced the bleeding at the time of excision appreciably, but did not seal the large arterioles. For this reason the instrument did not meet with general favor until Davis, of North Carolina, so modified it that, after the cutting had been accomplished, a diathermy current would be run through the loop electrode and the remaining bleeding points controlled by electrocoagulation.

To be successful, any instrument, when employed for transurethral prostatic resection, must meet the following requirements: First, the operative field must be clearly seen and the tissue to be removed examined in its relationship to the other structures about the neck of the bladder. Second, hemorrhage must be controlled and sufficient tissue removed at the time of operation completely to relieve the obstruction; this point cannot be too strongly emphasized, for if the obstruction is only partially relieved, residual urine will persist and secondary infection and congestion that will be most difficult to combat will result. I believe more poor results have followed the failure to remove enough tissue than ever followed complications resulting from removing too much.

Recently, McCarthy has modified his "panendoscope," which gives an unsurpassed view of the neck of the bladder, so that it can be employed satisfactorily in the removal of obstructing prostatic tissue, and Kirwin has also presented an instrument which, by first coagulating the tissue to be excised, prevents bleeding. The excision is done with a curved knife which rotates within the shaft of the instrument.

Tyvand has incorporated with the Braasch instrument the principle of first coagulating the tissue to be excised. By means of a multiple needle electrode, the path of the tubular knife through the tissue is electrocoagulated rather than the entire tissue as in the Kirwin instrument. This diminishes the bleeding appreciably, and reduces the time formerly consumed in electrocoagulating the incised surface at the end of the operation (Fig. 1).

It is frequently asked, will the relief of obstruction be permanent? The answer is, not in all cases, for every year one sees the recurrence of prostatic obstruction following previous prostatectomy, but if recurrence does take place in a minority of cases, a repetition of the procedure is in no way contraindicated and carries little risk.

It has long been observed that an enlarged prostate gland shrinks appreciably in size once the residual urine is removed by suprapubic drainage. There seems no reason to doubt that the same diminution in size will occur if the residual urine is relieved by some other method.

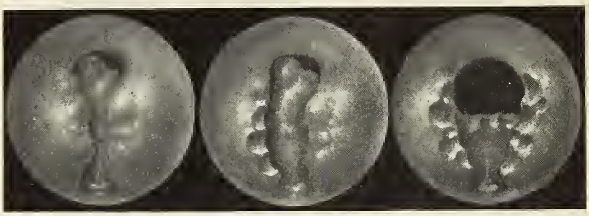
Fig. 1. Views of prostatic urethra before resection, at the time of resection, and following resection.

In 42 per cent of the cases of prostatic hypertrophy treated surgically at The Mayo Clinic during 1931, transurethral prostatic resection was performed. All of the patients were free of residual urine at the time of their dismissal, although many had had acute retention or had led a "catheter life" for some time previous to operation. Since January, 1926, more than 300 cases have been so treated at the clinic; the functional results compare favorably with those of prostatectomy. If residual urine can be completely relieved by a transurethral procedure, there are few patients who will part with the prostate gland to accomplish the same result.

DOUBLE UTERUS AND VAGINA WITH UNILATERAL ATRESIA*

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CONGENITAL malformations of the uterus and vagina are perhaps more common than is generally supposed. Their seeming infrequency is due, in part, to the fact that a great many produce no symptoms. And so, in these cases, unless discovered during a routine physical examination or found accidentally during an abdominal operation performed for some other lesion, they may go through life and childbearing wholly unaware of any malformation.

Again many of these anomalies prove to be real surgical problems because they are discovered accidentally by the abdominal surgeon, and just as the gynecologist may be called upon to do an intestinal resection, so the abdominal surgeon must decide what procedure, if any, should be carried out in a given malformation of the uterus. If symptoms and diagnosis are lacking preoperatively, what disturbance is likely to occur in the future?

Gynecologists differ in their opinion. Some state that double uterus causing no symptoms should be left undisturbed, while other believe that to leave a poorly developed uterus undisturbed is but to threaten the life of the woman should pregnancy occur.

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*Presented as an inaugural thesis before the Minneapolis Surgical Society Dec. 3, 1931.

Due to the wide variation of conditions encountered, each case is a law unto itself and no set rules can be formulated as to treatment.

Embryology.—The union of the right and left mullerian ducts occurs in embryos of 22 mm. to 28.5 mm. Union occurs first at the site of the future cervix uteri and advances thence in both the cranial and caudal direction.

With union completed, the portions that remain separate above are the primitive tubes. These primitive tubes consist of two portions, the upper vertical portions which are to be the Fallopian tubes, and the lower horizontal portions which are to be taken up into the uterine wall in its development.

The union of the two mullerian ducts is at first only an external one. Though forming a single external contour, in the interior each has still its own medial wall. Later the two medial walls fuse to form a septum. This septum becomes resorbed in the caudo-cranial direction, forming the utero-vaginal canal.

The formation of the wall of the utero-vaginal canal begins with a thickening of the surrounding mesenchyme. The resulting mesenchymatous wall surrounds the utero-vaginal canal and the horizontal portions of the primitive tubes. As a result the fundus uteri is formed from the horizontal portions of the tubes and the cervix uteri is formed from the utero-vaginal canal. The lumen of the uterus is thus given a triangular form.

In embryos of from 340 to 355 mm.[1] the circular muscle layers of the corpus uteri and those of the cervix fuse, and, in addition, the circular musculature of the corpus fuses with that of the tube. The two tubes meet the body of the uterus at an angle, and that produces a certain amount of confusion in the previously simple arrangement of the musculature. The inner strands of the musculature of the tubes pass directly over into the circular layer of the uterus, but the outer strands stream out as longitudinal bundles both on the ventral and on the dorsal surface of the uterus, and thus form an outer longitudinal muscle layer on the body of the uterus.

From the seventh fetal month to the end of pregnancy there is at first only an enlargement of the layers already present. In the body of the uterus the circular musculature always constitutes the principal mass. It grows in a threefold manner: (1) by an increase in the thickness of its parts; (2) by the development of new layers at the periphery; and (3) by the development of new layers between the bundles of the circular muscle. These last, the interstitial bundles, are sometimes oblique and sometimes longitudinal, and produce the felted mass of the adult uterus, whose constituent parts can scarcely be made out. The outer longitudinal bundles that stream down from the tubes become included in this confused mass.

Various degrees of failure of union of the two mullerian ducts, or an arrested development of these ducts result in the various malformations.

Different classifications of double uterus are given, including uterus bicornis bicollis, uterus bicornis unicollis, uterus septus, uterus subseptus and uterus didelphys. Uterus didelphys is the result of complete failure of union of the two mullerian ducts in those portions which normally fuse when a single uterus is formed.

In uterus didelphys we have two organs, which, from the embryology we know, are in reality but two halves of a uterus, lying apart and entirely separate externally. The medial walls of such uteri are weaker in structure.

Imperfect fusion and failure in resorption of the two medial walls of the lower portions of the two ducts results in double vagina.

In inflammations of the pelvis, septic emboli are more prone to occur in such uteri and, as Epstein and Goldberg[2] state, may be explained by the two uterine arteries not anastomosing as they do normally in front of and behind a single cervix, behaving similarly to a terminal circulation. They believe that in their case, that of a six and one-half months gravid uterus didelphys in which there was pelvic infection, resulting in streptococcic peritonitis, the necrotic right ovary may have been caused by a septic thrombus in the right uterine artery cutting off the blood supply of the ovary, since the ovary receives its blood supply mainly from the ramus ovaricus, a branch of the uterine artery.

Of the eleven cases of double uterus encountered at the Free Hospital for Women, Brookline, Mass., and reported by Puddicombe,[3] seven were of the bicornuate type, two were didelphys uteri, and two were classified under uterus planifundus septus, subseptus. Of these eleven patients, nine had abdominal operations. Three unilateral and three bilateral hysterectomies were performed. Puddicombe[3] also reports eight cases of uterus duplex from the records of the Boston Lying-In Hospital. Six of the eight were primiparæ. Of these cases, one was in labor slightly over seventeen hours and was delivered by low forceps; one had a ten hour labor and was delivered by mid forceps; one went forty-eight hours and was then delivered by cesarean section. In this case there was a beginning rupture of the uterus. Four of the remaining cases had cesarean section. One of these had a ruptured uterus at five and one-half months, having previously had four normal deliveries. The eighth case had a premature separation of the placenta and delivered herself of a seven months macerated fetus.

Abortions are common in cases of double uterus and even rupture of one horn may occur in the early months of pregnancy. Truesdale[4] reports a rupture at three and one-half months in a uterus bicornis unicollis and quotes Brugh as reporting one at two and one-half months in the same type of malformed uterus. Puddicombe[3] quotes Picot as reporting one case in which there were fourteen abortions and Gautermann as having cited a case in which three children were born from the right horn and nine abortions having occurred from the left.

Malalignment of muscle strands in such a uterus causes a lack of contractile power and a misdirection of the expulsive force resulting in dystocia and endangering rupture of the medial wall of the uterus. Epstein and Goldberg[2] point out that it is the exception for such cases to go through pregnancy and labor uneventfully. Their conclusions being to treat pregnancy in a double uterus as a nonruptured ectopic. Empty the uterus and correct the maldeveloped organ. They also state that if the condition is not discovered until the end of pregnancy, to be prepared for a severe postpartum hemorrhage, and be ready for a stormy puerperium.

Horn[5] and Caswell[6] both report a case of uterus didelphys with torsion of the pregnant right uterus at six months, bringing about such severe circulatory changes that gangrene ensued in half of the uterus.

The literature for the most part deals with the obstetric complications. While it would seem that conservatism should be urged here, more especially than in some other fields of surgery, some gynecologists have regretted that they did not sterilize the patient or remove the malformed uterus.

Utriculoplasty may be carried out with more success in the bicornuate type than in the widely separated uterus didelphys, in either type more safely if a dilatation of the upper genital tract does not exist (hematometra, hematosalpinx). In uterus didelphys with very short round ligaments and a wide pelvis, utriculoplasty would be impracticable.

In cases of double uterus and vagina with unilateral atresia a diagnosis may be very difficult. Symptoms do not develop until menstruation is established and there is an accumulation of menstrual blood in the occluded half. If one could be sure that hematosalpinx, with its thin wall and danger of rupture, did not exist, a simple plastic operation on the intervaginal septum would relieve the patient of her complaint. This operation was the only one mentioned in the earlier literature and its performance resulted in many deaths due to peritonitis.

It would seem then that exploratory laparotomy should be practised and in the didelphys uteri where utriculoplasty is impracticable one should remove the lesser developed of the two uteri or the one associated with diseased adnexa or the occluded vagina. Pregnancy occurs quite readily in these cases and the patient might still be subject to various obstetric complications. If simple sterilization without the removal of the remaining uterus seemed best, the patient would still have the benefit of the psychic effect from the retained function of menstruation, which is very important in such young individuals. Again conditions met with may be such that to remove both uteri seems the safer for the patient.

CASE REPORT

Miss M. D., fourteen years of age, was admitted to the Deaconess Hospital, January 3, 1931. She complained of pain in the rectum, and constipation. Menstruation began in April, 1929, occurred every three to five weeks, lasted three to four days, was moderate in amount and not associated with pain. Constipation developed in July, 1930, when with her menstruation she experienced a dull pain in the lower left abdomen and a feeling of pressure in the rectum as if the bowels were going to move. At stool she would strain with no result. With the August period she noticed an increase of pressure in rectum. In September the pressure symptom was more marked. She complained of pain in the rectum and severe abdominal cramps. Taking larger doses of cathartics, she would have a small soft stool every two or three days. Between periods she was quite comfortable lying down, until the November menstruation. Since then the pain has been more severe at night, causing the patient to get out of bed and walk. Walking about slowly was more comfortable than sitting. During November and December she was unable to study or sleep because of intermittent abdominal pain. In December she noticed she was tender to pressure in the lower abdomen. The pain extended down the back of the legs and she was very nervous and irritable. There was no urinary frequency nor painful urination.

Laboratory Report.—The urine was normal. A vaginal smear was negative. Hemoglobin 76; r. b. c. 4,490,000; w.b.c., 9,400.

Physical Examination.—There was a marked tenseness of the lower abdominal muscles. The external genitalia were normal. Per rectum a tense mass could be palpated. Vaginal examination under gas anesthesia revealed a tense smooth cystic mass extending from the hymen to the left along the vaginal wall as high as one could palpate. The narrow vagina ascended along the right side of the pelvis and because of the tumor mass the cervix could not be reached. There was no blue discoloration. The left vaginal wall felt uniformly thickened. Per rectum a very tense smooth pelvic mass occluded the lumen. The mass extended up to just below the umbilicus. The upper border seemed smooth and no irregularity could be made out through the rather fleshy abdominal wall. This tumor mass seemed fixed, and filled the pelvis.

Though we considered hematocolpos as most probable, we also felt that we might be dealing with some cystic tumor, as perhaps a cyst of Gartner's duct.

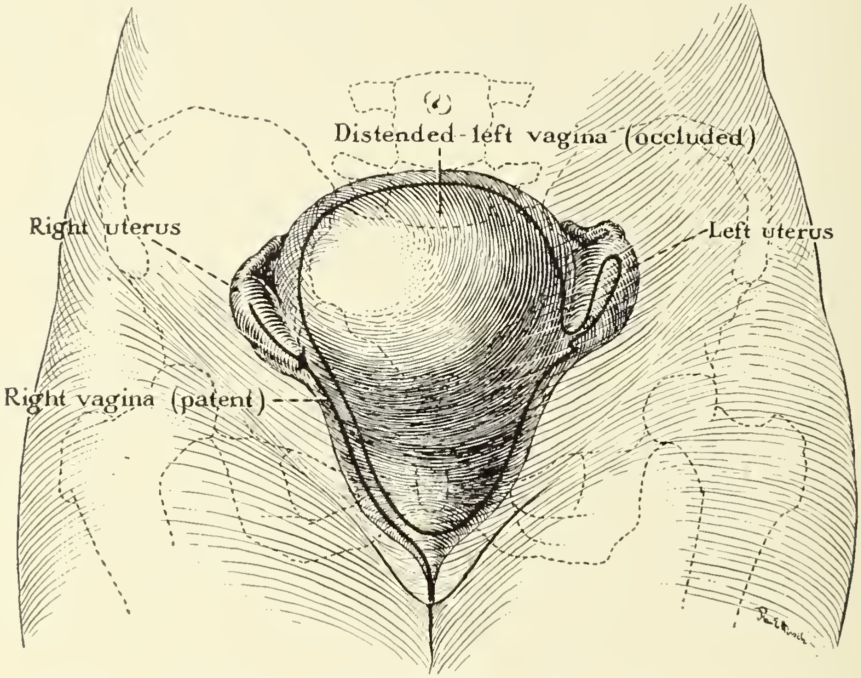

Fig. 1. Uterus didelphys and double vagina with unilateral hematocolpos and hematometra.

Operation.—On January 5, through a median incision we found that the upper smooth convex border of our tumor mass was the distended left vagina whose surface contained many blood vessels. To the right side of the distended left vagina was the long narrow right vagina and at its summit but almost at right angles to it was the right uterus. The left uterus was lying on the opposite side of the false pelvis in the same relative position. The left uterus was the larger and softer of the two. Each uterus had a tube and ovary attached. The round ligaments were drawn up taut to the ascended uteri and though stretched were not over 5 cm. in length. The enlarged and cystic right ovary was resected. The left ovary was normal. Upon deciding to remove both uteri and the upper portion of the left vagina, an incision was made in the dome of the tumor mass (the left vagina), and between two and three pints of a dark reddish black material of gelatinous consistency was removed.

Bilateral hysterectomy and salpingectomy with an amputation of the upper portion of the left vagina was completed, leaving a gauze pack in the left vagina. The abdomen was closed, the patient was placed in the lithotomy position and an incision made in the intervaginal septum. The gauze pack was pulled partly through the incision. This gauze drain was removed in forty-eight hours. The left uterus contained one ounce of old blood.

Upon examination September 12, 1931, the right vagina was found to be of normal depth, well supported and situated medially in the pelvis. The opening in the intervaginal partition had contracted down to about one inch in diameter.

Note: Discussion of this article appeared in the Proceedings of the Minneapolis Surgical Society in MINNESOTA MEDICINE, February, 1932.

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NORMAN BAKER VS. THE AMERICAN MEDICAL ASSOCIATION

Norman Baker of Muscatine, Iowa, who headed a number of mercantile enterprises, including the ownership of a radio broadcasting station and an alleged cancer cure, was dealt with, editorially, in the Journal A. M. A. of April 12 and April 19, 1930, and in *Hygeia* for May, 1930. As a result of these publications, Baker brought suit for libel against the American Medical Association, asking one-half million dollars in damages. This case came to trial in the federal district court in Davenport, Iowa; the trial opened on February 9 and continued until March 3, covering a period of nearly four weeks. On March 3, the jury returned a verdict for the American Medical Association. Baker had two (and, for a short time, three) alleged treatments for cancer that were being given at Muscatine in the building that was known as the "Baker Hospital." They were (1) a treatment for "external" cancer, an arsenic powder exploited by Harry M. Hoxsey, and (2) the injection treatment for "internal" cancers of one Charles O. Ozias of Kansas City. Baker broadcast over his radio station that he was going to investigate a cure for cancer (the Ozias "treatment") and that he wanted five men or women from any part of the United States or Canada who were suffering from cancer to consent to become a test patient for this treatment. These "test cases" were widely advertised by Baker. Here it may be interpolated that all five of the patients were dead for some time before Baker ceased advertising that "Cancer Is Conquered." Before closing its case, the American Medical Association put in evidence between twenty-five and thirty death certificates of patients who died at the Baker Institute. The Association also submitted seventeen death certificates of Hoxsey victims. During the course of the trial it was brought out that the State of Iowa had enjoined Baker from practicing medicine without a license and that the Federal Radio Commission had revoked Baker's broadcasting license, because it found that his operation of the station was inimical to the public interests. (Jour. A. M. A., March 19, 1932, p. 1012.)

PRESIDENT'S LETTER

THE United States is the largest modern nation without compulsory insurance. The essential feature of health insurance is the collection of a large number of small contributions from any employees, employers, and sometimes from the whole community through taxation, and the expenditure of the fund thus accumulated in meeting the individual emergencies due to sickness of those covered by the insurance scheme. Health, or sickness insurance (interchangeable terms) is a human problem, an effort to meet and care for the ills to which flesh is heir, and to remove as much as possible of the social, economic, and physical burden of that heritage.

Three main sources of information concerning such insurance are available in the literature, in which attitudes are rather sharply defined. A fourth source may share one of the angles presented by the other three. The first source is the official governmental reports, prepared by the officials who have charge of the governmental phase of the insurance system in question. Such officials are naturally swayed by political forces and are not likely to be sharply critical of their own work or of their departments. The second source is the reports of insurance funds or societies. These more or less independent organizations conduct most of the financial phases of insurance under some sort of governmental supervision. The huge funds are disbursed through three channels: cash payments during invalidism, fees for medical services, and payments for pharmaceutical supplies. Members of the medical profession issue certificates of invalidism, receive fees directly, and write the prescriptions. That is, the expenditures are largely determined by almost independent individuals, or organizations, such as the medical profession. This anomalous and peculiar situation explains many of the difficulties that arise. The third source is the publications of the medical profession. The insurance societies are prone to exaggerate the amounts paid for medical service, so it is only natural that the medical profession should respond by seeking to prove underpayment. The constant overemphasis on the financial side renders any scientific discussion very difficult. A fourth source of information is furnished by the elaborate and valuable studies of the International Labor Office. This office is by no means an impartial observer. It has been instructed by an overwhelming majority of its constituent nations actively to propagandize for compulsory health insurance.

The foregoing data are taken direct from the introduction to "The way of health insurance" by A. M. Simons and Nathan Sinai of the research staff of the Committee on the Study of Dental Practice of the American Dental Association. The medical profession of America owes these men and the Dental Association thanks, for this small volume is very timely. The introduction is clear cut and paves the way for the details that follow in the book. The authors proceed to point out the salient points in the systems of Great Britain, Germany, France, Denmark, Sweden, Norway, Austria, Hungary, and other countries. In the June issue of MINNESOTA MEDICINE a fuller and more interesting review is given than I can give here. This book* should be read by every member of our State Association and should be readily available for reference. I believe that every component society of our Association would do well to circulate one or more copies among its members. A sound understanding of the principles of health insurance will fulfill the old adage that "forewarned is forearmed," when these matters are brought up for consideration in our various legislative assemblies, as they surely will be.

M. S. Henderson.

President,
Minnesota State Medical Association.

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EDITORIAL

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ABUSES IN MEDICATION

The Interprofessional Relations Committee consisting of representatives of the druggists, dentists and physicians in Minnesota, is carrying on a commendable publicity campaign in the interest of economy in prescribing.

A variety of remedies has been developed in recent years by various pharmaceutical houses, possessing in many instances real therapeutic value, and put on the market under trade names. These remedies have been advertised to the profession and a real service to patient and physician has been rendered.

The fact remains that these remedies now appear in the Pharmacopœa and New and Non-official Remedies under their drug names and cost the druggist one-half to one-tenth as much as the same drug with the trade name. The average physician has learned the drug by its trade name and has not made the effort to learn the official title, this omission being an expensive proposition for the patient. When a prescription uses the trade name of a drug, the conscientious druggist must dispense the more expensive preparation, even though it is identical with the official preparation.

Calling the attention of the profession to the situation should result in a real reduction in the cost of medication, which is admittedly too high. It would be well for hospital superintendents or medical staffs to authorize hospital pharmacists to dispense the official drugs on all occasions in the interest of economy.

The druggist is interested as well. It is true that it is economy for him to purchase certain preparations rather than to take the time to make them up himself. But when a physician writes an expensive prescription, unknowingly very often, the druggist cannot add his usual percentage and make the sale. On the other hand the fact should not be lost sight of that the writing of the less expensive official drug offers the temptation to the druggist to make an extra profit at the expense of the patient who knows nothing about the comparative wholesale cost of preparations.

Another unwise practice on the part of physicians is the indiscriminate passing on to patients of pharmaceutical samples. Some are standard preparations and there is no more point in concealing their labels than in writing a prescription in Latin. Some of the samples, however, are patent medicines of unknown composition, and it is needless to say should never be dispensed. Some are drugs under trade names and dispensing these without removing the label simply serves to advertise an unnecessarily expensive remedy. Soon the preparation may be advertised directly to the public with the statement that it has been widely used by the profession. Thus the profession is unwittingly used to further selling the public directly and encourages self medication.

Another practice which furthers self medication is the writing of "original bottle" on a prescription. Too often the original bottle facilitates the purchase of addition bottles for neighbors and friends.

We all know there is a tremendous waste in the money spent for medicines in this country.

The Committee on the Costs of Medical Care has determined that the huge sum of $715,000,000, which is 20 per cent of the national bill for sickness, is spent annually in this country for medicine. Only a fourth of this represents physicians' prescriptions (part of which, of course, are useless). Another fourth represents non-secret home remedies purchased by the public direct. Half of the total is the bill paid by the nation for patent medicines of secret composition.

From this it is perfectly apparent that there is entirely too much self medication going on. Much of it is probably simply a waste and harmless. The druggists tell us, however, that certain drugs are being bought over the counter in this state which are not devoid of danger if used indiscriminately. Some states have extended the list of medicines obtainable only on physicians' prescriptions, and there is good reason to believe that Minnesota should follow suit.

STATE MEETING OF 1932

Those who attended the seventy-ninth meeting of the Minnesota State Medical Association which met in Saint Paul in May must have been impressed with the unusually fine program and the extended scope of the scientific exhibits. Expressions of interest and enthusiasm on the part of the large number of visitors from other states indicate that the Minnesota meeting is taking a place in the fore-rank among state medical meetings in America. The program committee is to be congratulated.

Some 1,030 physicians registered—a record for our state meeting. Additional registrations to the number of 694 included internes, medical students, nurses, exhibitors and members of the Women's Auxiliary.

The gold medal presented each year by the Southern Minnesota Medical Association for the best scientific exhibit was awarded this year to Dr. L. A. Buie of Rochester for his exhibit entitled "Proctology: Diagnostic and Surgical."

An innovation in this year's program was the arrangement of small group demonstrations which were held Tuesday and Wednesday mornings. The attendance at these group meetings demonstrated their popularity and they will probably be further developed at our future meetings. The same may be said of the scientific cinema.

Dr. N. O. Pearce of Minneapolis, who has been so active in association affairs for many years, was elected president for 1933. William A. Piper, Mountain Lake, was elected first vice president; F. R. Huxley, Faribault, second vice president; E. A. Meyerding, Saint Paul, secretary (re-elected), and W. H. Condit, Minneapolis, treasurer (re-elected).

Dr. J. M. Hayes of Minneapolis was elected to fill out the unexpired term of Dr. Pearce as councilor of the second district and Dr. H. Z. Giffin of Rochester was re-elected councilor of the first district.

THE MINNESOTA CANCER SURVEY

There is no question in the entire field of medicine now receiving the attention given to cancer, its diagnosis, treatment and care. Enough is now known to point the way to the development of better methods of treatment and care.

Cancer is the outstanding challenge to the medical profession today. Its constantly mounting mortality, its discovery in younger and younger age groups, and its widespread distribution makes it most important to know as definitely as possible all factors bearing on the disease. From past experience it is realized that these factors are not of universal application but vary for each community. For this reason a standardized program of cancer control cannot be formulated but must be built around the factors controlling the situation in a given locality or state.

The Minnesota State Medical Association has long been interested in cancer and this interest has culminated in an invitation to the American Society for the Control of Cancer to make a state-wide survey of this disease, reporting its findings with recommendations to the medical society for its guidance in the development of an improved program of cancer service in this state. The Cancer Society accepted the invitation for the survey, which will be made without expense to the medical association, and Dr. F. L. Rector, Field Representative for the central district in which Minnesota is located, will begin the field work in the very near future.

It will be necessary for the hospitals of Minnesota to furnish certain information and for this purpose a short questionnaire will be sent to each hospital of about fifty beds and over asking for certain facts including a minimum of statistical data. Dr. Rector plans to visit most of these hospitals in order to discuss the problem with hospital authorities and staff members. Hospitals can render a distinct service by supplying the requested information at the earliest possible date.

This survey is a *fact finding undertaking.* The report will discuss the findings, and the recommendations will be based on the analysis of the collected material. The field work will require several weeks for its completion. The objective always kept in view is the development of a better service to the cancer patient and a better understanding of this problem by the medical profession. The control of cancer belongs to the profession and the report of this survey will carry a suggested program in which the medical profession will have a major part, the details of which will be developed as the work progresses.

Please keep this survey in mind, and when Dr. Rector calls on you for assistance be as helpful as you can, remembering that this survey is undertaken at your request as a member of your own medical association. This report, developed by an unbiased national organization constantly studying this problem in all parts of the country, should prove of great value to the physicians of Minnesota. It will be awaited with interest.

Dr. Harold E. Robertson, Rochester; Dr. J. C. Litzenberg, Minneapolis; Dr. John L. Rothrock, St. Paul, and Dr. Arthur N. Collins, Duluth, have been appointed a special committee to coöperate with Dr. Rector in the survey and receive his report.

W. A. O'B.

OF GENERAL INTEREST

Dr. E. O. Voyer, Minneapolis, sailed June 22 from New York for Europe where he will attend clinics in Paris and Vienna and the British and Canadian medical convention in London. Dr. Voyer will return about the first of September.

Dr. Thomas K. Moen, Minneapolis, has been appointed to the staff of the Rockefeller Institute in New York City. Dr. Moen will be engaged in the investigation of acute rheumatic fever, with Dr. Homer Swift. For the last three years he has been assistant in the University Hospital, Minneapolis. He will leave for New York in September.

Dr. Edward C. Emerson of Saint Paul was recently elected secretary of the American Medical Association chapter in Budapest. Dr. Emerson left last March to study in the clinic of Dr. Polya, noted European surgeon. Following the attendance of other clinics in Vienna, Paris and London, Dr. Emerson will return to Saint Paul some time this month.

Dr. and Mrs. B. O. Mork and son Raymond of Worthington, Minnesota, sailed in June for Europe where they will spend about two and one-half months. They plan to visit Berlin, taking a trip on the Rhine River and will spend some time in Hamburg, Copenhagen, Stockholm, and Aalesund on the west coast of Norway, the home of relatives of Dr. Mork. On their return home they will visit London, Oxford, and other places of interest.

Dr. H. E. Chamberlain, director of the Minneapolis Child Guidance Clinic at Lymanhurst Hospital, Minneapolis, has resigned his position effective September 1. Dr. Chamberlain has accepted the position of associate professor of psychiatry at the University of Chicago. He will spend the month of July at Smith College, where he will serve as instructor in social psychiatry in a summer school for social work.

Nominations are in order for the fourth award of the Saunders Medal, bestowed annually on the American nurse chosen for having "made to the profession or to the public some outstanding contribution either in personal service or in the discovery of some nursing technic that may be to the advantage of the patient or the profession. The only kind of service excluded is that of writing." Names with a description of the accomplishments of the candidate may be submitted either directly or through a state association of nurses to the national headquarters of the American Nurses' Association, 450 Seventh Avenue, New York.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

ST. PAUL NATUROPATH PLEADS GUILTY

State of Minnesota *vs.* Herman C. Frerichs

On June 2, 1932, Judge Carlton F. McNally, of the District Court of Ramsey County, sentenced Herman C. Frerichs, fifty-two years of age, who claimed to be a naturopathic physician, to pay a fine of $100.00 or serve thirty days in the Workhouse for practicing healing without a Basic Science Certificate; Frerichs paid the fine.

Frerichs maintained an office in his home at 601 Dayton Ave., St. Paul, Minn., for the purpose of practicing naturopathy. He had considerable equipment for the giving of light ray and diathermy treatments. Frerichs claims to be a graduate of Heidelberg, but apparently is unable to produce his diploma or other credentials. In 1927 Frerichs obtained a massage license from the old Massage Board but voluntarily surrendered it in 1929 when the masseurs were placed under the regulations of the State Board of Medical Examiners.

Following his arrest on April 12, 1932, Frerichs removed the signs from the front of his home and was instructed by Judge McNally to remove his listings from the telephone directory and the city directory. He was also warned by the Court against attempting to practice healing in the future until he was properly licensed. Frerichs claims to have been engaged in the healing art for the past twenty-one years; his activities were first called to the attention of the Medical Board early in 1930, and following an investigation Frerichs agreed in writing to refrain from practicing healing in the future. His failure to comply with this agreement resulted in his arrest.

Splendid coöperation was received in the prosecution of this case by the State Board of Medical Examiners from the St. Paul Police Department under Chief Brown, in addition to the splendid attitude displayed by the staff of M. F. Kinkead, County Attorney. This is the first case instituted by the Medical Board to come before Judge McNally for disposition and the warning given by the Court to Frerichs, as well as the sentence imposed, indicates a desire on the part of Judge McNally fairly and firmly to enforce the provisions of the Basic Science Law.

OBITUARY

Dr. John Wesley Andrews

1849-1932

Dr. J. W. Andrews passed away at his home in Mankato on May 16, 1932, at the age of eighty-three years. He was well known to members of the State Medical Association, having been active in association affairs during his fifty-five years of medical practice, forty-seven of which were spent in Mankato.

Born in Lawrence County, Illinois, April 6, 1849, the son of a Methodist minister, he came to Saint Peter in the fall of 1856. After attending the local public schools, Dr. Andrews attended the old Normal School at Mankato in 1868, where he contracted typhoid fever. After teaching three years in the high school at Saint Peter, he began the study of medicine, attending lectures at Michigan University for a while and graduating from Rush Medical School in 1877.

On April 4, 1878, Dr. Andrews married Miss Jennie French at Marshall, Minnesota. Mrs. Andrews passed away in 1923.

Returning to Minnesota, Dr. Andrews practiced for three years at Marshall before locating in Mankato. In 1886 he studied in Berlin and Vienna.

Dr. Andrews and his son, Dr. Roy Andrews, were charter members of the Mankato Clinic which was organized in 1916. Although not in active practice since 1923, Dr. Andrews maintained an office in the clinic.

Dr. Andrews was recognized for his surgical ability and was a member of the American College of Surgeons. He was at one time president of the Minnesota Valley Medical Association and of our State Association. His varied activities are evidenced by his having been at one time president of the Mankato Board of Trade, forerunner of the present Chamber of Commerce, president of the board of directors of the Y. M. C. A., and a director of the First National Bank. He was also an active Mason.

In April, 1907, Dr. Andrews was elected Mayor of Mankato and from 1914 until 1918 served as state senator for Blue Earth County. His activities in community affairs continued even in his later years, and from 1929 to 1931 he was a member of the Mankato Board of Education, serving as president in 1930 and 1931.

In late years Dr. Andrews traveled extensively. He visited Panama and the West Indies and in 1923 joined the cruise to South America with the American College of Surgeons. In 1925 he took the Mediterranean trip.

Dr. Andrews is survived by four brothers and sisters, one son, Dr. Roy Andrews, of Mankato, and one granddaughter.

Dr. James Franklin Kline

1862-1932

Dr. James Franklin Kline, 70, founder of Kline's sanitarium at Anoka, died May 19, 1932, at his home in Anoka, after a two weeks' illness. He had been a resident of Anoka for thirty-nine years.

Born in Richville, Pa., January 4, 1862, Dr. Kline attended the public schools of Pennsylvania, and was graduated from the Bryant and Stratton business college in Cleveland in 1879. During the school year 1884-85 he took a special business course in Minneapolis.

He was graduated from the college of medicine at the University of Minnesota in 1893. He came to Anoka soon afterward.

For several years he was surgeon for the Great Northern railroad. He was a member of the Royal Neighbors, Royal Arcanum, Woodmen, Workmen and Degree of Honor.

He was married September 15, 1888, to Miss Anna Griffith. He is survived by his wife; two daughters, Mrs. Harland Cushman, Yonkers, N. Y., and Mrs. Fred Meyer, Anoka; two sons, Franklin J. Kline, Minneapolis, and Dr. Harry Kline, Anoka, who was associated with him at the sanitarium; and a brother, Charles Kline, Columbus, Ohio.

Dr. W. F. Cobb

1847-1932

Dr. W. F. Cobb, pioneer physician in Mower County, Minnesota, died at his home in Lyle early in June, 1932. Dr. Cobb was born in Maine June 14, 1847, making him within a few days of eighty-five years old at the time of his death.

The Cobb family moved from Maine to Wisconsin before coming to Iowa. For a number of years the family lived at Mona, a village one mile south of Lyle. Dr. Cobb received the usual preliminary education of those early days and then entered the University of Wisconsin in 1865, graduating in 1870. In the fall of that year he entered the Chicago Medical College and was graduated in 1874. He then returned to Nona and started his practice, remaining there until 1895, when he moved to Lyle.

On April 30, 1871, Dr. Cobb married Abbie C. Mason of Rutland, Wis., and to this union were born four children: Edith A., Edna M., Ethel M., and Enid H., two of whom survive, Edna, Mrs. N. C. Putman of Lyle, and Edith, now Mrs. L. O. Olson, of Northfield. together with his wife.

Dr. Cobb, during the greater part of his life, took an active part in the official and private life of Mower County and attained an enviable position among the medical fraternity of this portion of the state. He was a member of the American, Minnesota State, Mower County and Mitchell County Medical Associations, having served as president of the Mower County unit and treasurer of the Mitchell Connty organization.

For six years Dr. Cobb was mayor of Lyle. He also served as president of the school board there, president of the Lyle Telephone Company and was local surgeon at Lyle for the Illinois Central Railroad Company, as well as for numerous insurance companies and fraternal orders. In politics he was a Republican. He was a life-long member of the Congregational Church. He was a high degree Mason and a member of various other fraternal orders.

MISCELLANEOUS

SOCIAL INSURANCE

Edward H. Ochsner, M.D.
Chicago

QUALITY OF MEDICAL SERVICES DETERIORATES UNDER COMPULSORY HEALTH INSURANCE *(continued)*

Some fifteen years ago when the prices of eggs and chicken feed were at their highest, I wrote my farmer and asked him why he was not sending us any eggs. I received the following laconic answer: "The pullets look good but lay no eggs." Superficially examined, Compulsory Health Insurance "looks good" but unlike my pullets it has laid many eggs, most of which are addled.

When we substitute governmental control in medicine and dentistry for independent individual action, we stifle self-expression, individuality, initiative, courage, confidence, enthusiasm, and industry. We, as a nation, are on the whole already over-standardized. The very ones who wail the loudest about the evils of mechanization are often the very ones who clamor the most for more government control. Excessive bureaucratic and lay control have much the same spiritual effect upon the professional man as over-mechanization has upon the intelligent craftsman. They both have a tendency to crush out fortitude, ingenuity, and pride of achievement in those engaged in these vocations. With some, standardization has become almost a fetish in spite of the fact that when pushed too far it always results in mediocrity. The efficient successful practice of medicine always has been and always will be a personal unstandardized affair.

That the quality of medical services has deteriorated in those countries which have Compulsory Health Insurance is due to many causes, among which may be mentioned the excessive number of calls upon the time and energy of the physician. Those who receive free medical services are constantly running to the physician for every trifling ailment or compelling the physician to make many unnecessary calls at the homes. Every Krankenkasse physician who has been interviewed has stressed this fact. Baeumer states in his book that between sixty-five and seventy per cent of all calls are unnecessary, consume the time and eneregy of the physician and the resources of the Krankenkasse, and prevent adequate medical services and hospital care to the really sick. Liek in his book says the number of trivial conditions such as "microscopic skin abrasions, etc.," disgusted him so much that he retired from the service. This abuse has grown to such proportions in Germany that the government department has been compelled to issue new regulations to the effect that the insured have to pay a certain fee out of their own pockets for each prescription. This again has given rise to new abuses. A common sequence of new regulations to correct one abuse is to create an opportunity for newer ones. In England unnecessary night calls became so common that many panel physicians disconnected their phones between ten o'clock P. M. and seven o'clock A. M. A fine state of affairs if a patient has a strangulated hernia or an attack of gall stones or acute appendicitis at midnight! We have all repeatedly seen and heard the statement that the workers of this country do not have medical services when they most need them—namely, at the beginning of an illness. The claim is made that were prompt services available at this time much serious illness could be avoided. Conclusive proof that private practice is more prompt than Compulsory Health Insurance practice is evidenced by the practice in England of avoiding night calls, and by the fact that the percentage of pus appendix cases, which necessitate draining, is much greater in Germany than in the United States. We all know how the mortality rate is increased by letting acute appendix cases progress to suppuration before they are operated and how much longer the period of hospitalization is in suppurative cases. If acute illnesses had more prompt and more efficient treatment in Germany, for instance, than in the United States, suppurative appendix cases should be much less frequent, the mortality rate should be lower and the morbidity shortened. As a matter of fact, the reverse is the case, which proves rather conclusively that medical services in the United States are more efficient than those in Germany. Such abuses result in endless rules and regulations—rules that accomplish little except to cramp the individuality and personality of the conscientious physician, wear him out with paper work and leave little time and energy for professional study and advancement. One official described his plight in the following words:

"I've settled into official routine; I'm fixed there hard and fast. It's so with many of us. Most of us recognize the hopelessness of ever pulling out. As I sometimes confess, I am merely one of the unburied dead."

That Compulsory Health Insurance does not in fact prevent sickness nor reduce economic loss as the result of sickness is also proven by the following facts. Before the World War the average loss of time for sickness of the American laboring man was six and two-tenths (6.2) days per year; the German's, nine and two-tenths (9.2) days; the Austrian's, nine and five-tenths (9.5). We are credibly informed that since 1923 the loss of time in Germany has increased another eighty per cent above the nine and two-tenths (9.2) so that it now stands at approximately sixteen and five-tenths (16.5) as against six and two-tenths (6.2) in America. A fine showing for Compulsory Health Insurance after forty-eight years of operation!

Let us see what some of the German and English think about the scheme. A high salaried German health insurance official said the following in 1927: "Health insurance is the oldest branch of German Social Insurance. The sickness insurance law of June 15, 1883, was the cornerstone of the proud building for which we were envied by foreign nations before the war. Unemployment insurance will, I hope in the near future, be the capstone of the building." To which Edwin Liek, a practicing physician of Danzig, makes the following retort: "This is an expression familiar to physicians, words that we have frequently heard during the past four decades. Only now they affect us differently. In the beginning the doctors believed these dulcet tones; today only *parasitic physicians* or *pure fools* join in this festive song." And again he says, "Social insurance is today organized to fill the feed trough of *bureaucratic drones*." At a recent meeting of the Trade Union Council in Nottingham, England, a resolution was passed unanimously demanding that the Government overhaul the Department of National Health.

That the average American citizen is getting better medical services than are the citizens of those countries which have had Compulsory Health Insurance the longest is borne out by the cited statistics, the quoted opinions as well as by a rather extensive personal experience both in this country and in Central Europe.

(The next two articles will show how Social Insurance undermines national character.)

REPORTS AND ANNOUNCEMENTS *of* SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

SPEAKER: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of July will be as follows:

July 6—Management of Heart Disease.
July 13—Vitamin "A."
July 20—Purpose of Vacations.
July 27—Cancer of the Mouth.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS

The American Board for Ophthalmic Examinations will hold an examination in Montreal on Monday, September 19, 1932, at the time of the meeting of the American Academy of Ophthalmology and Otolaryngology.

Necessary applications for this examination can be procured from the Secretary, Dr. William H. Wilder, 122 South Michigan Avenue, and should be sent to him at least sixty days before the date of the examination.

MINNESOTA STATE HOSPITAL ASSOCIATION

At the recent meeting of the Minnesota State Hospital Association held in Saint Paul the following officers were elected for the coming year: President-elect, J. G. Norby, superintendent of Fairview Hospital, Minneapolis; president, James McNee, superintendent of St. Luke's Hospital, Duluth; first vice president, Dr. Charles Remy, superintendent of Minneapolis General Hospital; second vice president, Sister Patricia of St. Mary's Hospital, Duluth; secretary-treasurer, A. N. Calvin, Midway Hospital, Saint Paul.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of April 13, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 13, 1932. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were forty-seven members and two visitors present.

Minutes of the March meeting were read and approved.

The President announced that the Executive Committee decided to have the May meeting on the third Wednesday of the month, May 18th, on account of the regular date conflicting with the A.M.A. meeting in New Orleans.

The scientific program of the evening was as follows:

Dr. John F. Noble (St. Paul) read his Inaugural

(Continued on page 503)

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

Early in the negotiations between the special committees of the American Medical Association and of the American Legion, the Administrator of Veterans' Affairs suggested that physicians who asked for substitution of civilian hospitals for use of veterans in place of further government hospital building were putting themselves in an untenable position.

He suggested that the physicians would do much better to join in an attempt to repeal the section of the law that permits government hospitalization for non-service connected injuries of ex-service men.

In making that suggestion the administrator was disregarding the fact that the American Medical Association had already indicated its disapproval of section 202.10 and was proceeding with its present program only because it was convinced that once such a benefit was bestowed and in operation it could not be cancelled. No benefit was ever yet taken away from war veterans, once it was conferred.

That the physicians are justified in their attitude is indicated in the failure of the sections related to veterans in the economy bill which recently passed Congress. The bill as submitted would have eliminated hospitalization for non-service connected disabilities as well as many other benefits with an estimated saving to the government, in this time of need, of some 50 millions of dollars. As it emerged, veterans' benefits remained as they were with the exception of a few restrictions with regard to emergency officers' retirement pay.

The principle of the government's obligation to take care of the sick soldier, whether his injury was of war origin or not, is firmly intrenched and all but impossible of reversal. Probably considerations of economy will never be able to dislodge the principle. They may, however, modify its application to permit the use of civilian medical and hospital facilities for some classes of veterans' cases to replace further building of expensive government hospitals.

A widespread discussion of the lavish scale on which the government has cared for veterans has accompanied the attempt to force reductions of these expenditures through the economy bill. The need for some check in the government hospital systems has become obvious to a great many people, not heretofore concerned. The outcome will not be repeal of 202.10. But it may be a serious consideration of the plan to use the non-federal hospitals as proposed by the Minnesota Legion, endorsed by the American Hospital Association and in principle agreed to by the American Medical Association as an indispensable part of any plan for the best care of acute medical and surgical conditions in veterans.

(Continued from page 501)

Thesis entitled "The Relationship of Hepatitis to Cholecystitis."

DISCUSSION

Dr. O. H. Wangensteen (by invitation): I believe clinicians generally will welcome this study of Dr. Noble. It is my impression that it is the best approach to the solution of the problem. Too often the hepatitis has served the surgeon as an explanation for unhappy results following surgery upon the biliary tract. It is rather unusual and perhaps not without significance that pathologists, who are undoubtedly quite conversant with most of the pathological disturbances that affect the liver, should have taken no cognizance of the predicated relationship between cholecystitis and hepatitis.

I would infer from Dr. Noble's study that there is an even higher degree of correlation between the age factor and hepatitis than exists between cholecystitis and hepatitis. It is a remarkable fact that these changes in the liver are observed almost entirely on the superior surface, and only very rarely on the inferior surface where the liver comes in contact with other viscera. Some six or seven years ago I undertook the study of the alleged relationship between cholecystitis and hepatitis experimentally. It was found that when acute infections were established in the gallbladder of the dog, attendant microscopic findings were almost uniformly found in the liver. The greater number of these animals died, however, of peritonitis and other effects of sepsis. Success was finally achieved in establishing a chronic cholecystitis in the gallbladder of the dog by placing gauze, agar, and attenuated culture of streptococcus in the gallbladder. In no instance in 18 animals in which chronic cholecystitis was established in the gallbladder did an interstitial hepatitis develop. Incidentally, when human gall stones were placed in the dog's gallbladder, they dissolved rather quickly and no trace of calculi remained. Dr. Ivy has since elaborated some interesting facts from a similar observation made in his laboratory.

Pathologists recognize both parenchymatous and interstitial changes in the liver. These effects in the liver which surgeons have referred to as hepatitis of gallbladder disease, pathologists would probably describe as not being unusual microscopic findings in the liver. The gross changes that the surgeon sees at operation are undoubtedly only involutional changes in the capsule—a perihepatitis.

One cannot escape the impression that pathologists are too lenient with surgeons in the diagnosis of cholecystitis upon removed specimens. Even the gall bladders of newborns show pericholecystitis.

It is not an uncommon thing in medicine that our knowledge of therapeutic agents of relief comes before the causes of the disease are ferreted out. To this, gallbladder disease is no exception. The manner in which the gallbladder becomes diseased is still not fully clarified. Naunyn said that all gall stones were the result of infection. Aschoff and Bacmeister later excepted the cholesterin stone. Today we admit that a large number of gall stones are not the result of infection. Stasis in the gallbladder has been blamed as the exciting factor in cholecystitis and cholelithiasis. Still Boyden found that the gallbladders of women (in whom gallbladder disease is two or three times more common than in men) empty more rapidly than the gallbladders of men. Gall stones appear to be as common, statistically, in unmarried as in married women of the same age. Much remains to be found out concerning the genesis of gallbladder disease.

I feel that this study of Dr. Noble is very much worth while and should deal a death blow to the opinion that these scars observed on the liver have any special pathological significance as related to the absence or presence of disease in the gallbladder.

Dr. F. R. Wright (Minneapolis): It seems strange to me that a man who has done as much careful study as Dr. Noble has should overlook entirely in his essay the condition of the common duct. It is well known that the best way to cure inflammatory diseases of any organ is to establish drainage. The reason we have infections of the kidney is that proper drainage is interfered with.

In 1913 a man from Boston came out here and startled the medical profession by telling them that the bladder was not as easily infected as had formerly been taught. This is true, and has been taught at the University of Minnesota for thirty years, that the bladder was not easily infected unless drainage was interfered with (circulation interfered with).

I can see no reason why, if we have good drainage of the gallbaldder, the infection should not entirely recover. The gallbladder is a reservoir; bile from the liver comes down and is stored up in it. If there is free drainage into the intestine there should be no long-continued infection.

In this study there is no mention of the common duct apparently. If the common duct is normal the gallbladder should have perfect drainage and get well.

Dr. A. T. Mann (Minneapolis): I can't quite see yet why what we see at operations is not so, i.e., why the changes in the liver which are confined to the areas centering about the chronic gallbladder in such a marked way are not closely connected with the chronic inflammation in the gallbladder. The marked changes are always in the area centering about the gallbladder. Of course, these changes may occur sometimes in a liver which may show the wide-spread fine markings of a cirrhosis scattered pretty well throughout the whole liver, but I am not talking about that. I am talking about the definite markings located in the area about the gallbladder, and which are of a distinctly higher grade.

At one time I collected some fifty-seven cases, most of which were below forty years of age, and practically every one of these cases showed markings on the liver in the region of the gallbladder. We graded them in four grades. In the first grade were those in which we could see the yellowish-white spots of connective tissue in the liver, more or less confined to the gallbladder area. They usually radiated from the gallbladder margin of the liver. In the second grade there were real fan-shaped streaks in the liver, more dense near the gallbladder margin, with only little streaks and spots for a few inches, but the gallbladder was fastened more strongly to the liver than normal. In the third grade, this chronic inflammation in the liver had gone on to such a degree that the liver showed small spindles of liver tissue sticking up between these definite scars, fan-shaped again. And in our fourth grade I found two cases in which there was a half-moon of the liver that had apparently all gone and which looked like leather, yellowish-white and wet. These were all cases which had suffered for some time and in which the diagnosis had been studied sometimes by our group, and sometimes by two or three successive groups before they came to our group. They were all very thoroughly studied. They had definite symptoms and definite disability. It seems to me there must be in some of these cases an infection from the gallbladder going toward the liver.

Until it can be shown that there is some definite cause, other than the chronic gallbladder inflammation for the grouping of these markings about the gallbladder area, I feel strongly that it does not answer at all to make any general theoretical statement about changes in the connective tissue of a wide-spread cirrhotic condition in the liver.

I was very much interested in the younger ages in which we found these gallbladders. We had one gallbladder in a patient under 25 years of age. I do not recall exactly, for these were studied about 10 years ago. We divided them into 5-year periods, between 25 and 30, between 30 and 35, and between 35 and 40, and we had nearly as many between 30 and 35 as we had between 35 and 40. The only way we could figure out the initial cause in the etiology was very indefinite, but we took all the past diseases these patients had had and the nearest conclusions we could arrive at were that the gallbladder disease starts a good many years before we think it does, and it starts long before stones form. The nearest we could get was that the childhood infections of scarlet fever, sore throat, etc., were probable determining factors.

It seems to me there must be a definite group in which there is a definite infection from a chronic cholecystitis to the liver.

Dr. J. A. Johnson (Minneapolis): I appreciate very much the splendid work and presentation by Dr. Noble. From a clinical standpoint, I have never been able to hold gallbladder lesions responsible for much permanent liver damage. When one stops to consider all the toxins that are taken into the intestinal tract and pass through the portal circulation into the liver, it is not surprising that many changes take place in that organ. It is, undoubtedly, through this source that major damages occur. It is very common to find a normal gallbladder with extensive liver changes. I feel, therefore, that we should be very careful about blaming the gallbladder too much for what happens to the liver.

Dr. Noble (in closing): I want to thank Dr. Wangensteen for his discussion. It was largely because of his stimulus and suggestions that this work was started. He was interested to know whether or not the hepatitis described by Graham was significant. I consented in 1926 to attempt this study. The material was collected from the autopsy service at the Ancker Hospital in 1928 and 1929 but was not worked up until 1931.

I want to make myself clear with reference to the findings in the gallbladders of the newborn. The leukocytes found here must be considered normal. They are not the result of inflammatory stimulus but must be interpreted simply as wandering cells lodged in the tissue spaces.

With reference to Dr. Wright's criticism, I want to say that, although the fact was not mentioned, the common and cystic bile ducts in all of the cases described were studied grossly and all were found to be patent. In none of the cases was there any anatomic obstruction of these passages. In spite of the absence of an obstructive element, the livers in these cases, as you saw, showed an inflammatory infiltration of the portal spaces.

In answer to Dr. Mann's remarks with reference to scarring of the liver capsule, I want to point out the fact that these scars appeared as frequently on livers in the region of normal gallbladders as in those showing cholecystitis. All clinical authorities are in agreement with Dr. Mann's statement that cholecystitis in younger individuals frequently follows such infectious diseases as scarlet fever, rheumatic fever, streptococcic sore throat, and middle ear disease.

I agree with Dr. Johnson, that in all probability absorption of bacteria and toxins through the portal blood stream is responsible for the constant finding of inflammatory cells in the liver. As Dr. Johnson intimated, cholecystitis is seen in a high percentage of cases of cirrhosis of the liver.

Dr. E. M. Hammes (St. Paul) reported a case of cavernous hemangioma of the sixth and seventh dorsal vertebræ with compression syndrone of the spinal cord, and marked spastic paralysis of eight months' duration, with two laminectomies at six-month intervals, and with complete recovery except for a positive Babinski. An article on Cavernous Hemangioma with complete case report will be published later.

Dr. A. A. Zierold (Minneapolis) reported a case of "Cyst Within the Common Duct."

DISCUSSION

Dr. R. E. Scammon (Minneapolis): There have been occasional reports or descriptions of small diverticula of the common bile duct. That is quite common in the lower animals. However, as I understand it, this cyst lay within the lumen itself, and that seems to me very peculiar. It does not seem very likely that it is embryologic in its etiology. Certainly these cysts are quite unusual in the human embryo. Occasionally we see little outgrowths, but even these are very unusual.

The meeting adjourned.

R. T. La Vake, M.D.
Secretary.

PROGRESS SECTION

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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MEDICINE

TUBERCULOSIS ABSTRACTS*

Health examinations of students in high schools, colleges and universities are being applied more widely every year. Latent defects are thus brought to light and early treatment results in correction or cure of the incipient disease. Agencies for the control of tuberculosis have been among the leaders who stressed the importance of health examinations, and the value of the application of the tuberculin test and X-ray examination in the discovery of latent tuberculosis has been repeatedly demonstrated. The results of a recent investigation at the Henry Phipps Institute in Philadelphia into the incidence of tuberculous infection and tuberculous

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*Reprinted from *Tuberculosis Abstracts*, a review for physicians issued monthly by the National Tuberculosis Association, July, 1932, Vol. V, Number 7.

disease in medical and college students are presented below. Although the high incidence of tuberculosis in medical students may present a special problem the value of health examinations, here illustrated, has universal application.

Tuberculosis In Medical And College Students

Since medical students either during their medical course or in subsequent years often become ill with tuberculosis, a study was undertaken to determine the frequency and severity of tuberculous infection among medical and premedical students of the University of Pennsylvania. The usual methods of investigation into the incidence of tuberculous infection and disease were employed.

After the weight and height had been recorded, inquiry made concerning respiratory disease with which they had suffered and possible exposure to tuberculosis noted, students were given intracutaneous tuberculin tests, stereoscopic roentgenological examination of the chest and, when the latter revealed tuberculous infiltration of the lung, physical examination.

Results of the tuberculin tests of 236 premedical and 439 medical students are shown in Table I. There was no continuous increase in successive classes of the number of premedical students who reacted to tuberculin, variations being doubtless dependent upon the small number in each class. The percentage of premedical students that reacted to tuberculin was 85.6 per cent. The number of medical students of the first year who reacted was approximately the same, namely, 84.8 per cent. In the second and third year classes the number who reacted was higher, and in the fourth year it reached 98.2 per cent. The continuous increase in the frequency of infection during the medical course corresponds with the increasing number of tuberculous infiltrations found by roentgenological examination.

TUBERCULOUS LESIONS FOUND

Table II shows the result of roentgenological examination of 731 medical and premedical students arranged in classes. Calcified nodules in lungs or lymph nodes represent tuberculous infection, usually acquired in childhood. Their opacity and sharp definition distinguishes them from the diffuse lesions that are listed in the table as latent apical tuberculosis and manifest tuberculosis. They are doubtless in process of healing but their presence does not exclude the occurrence of progressive tuberculosis.

Calcified nodules of the lungs or the adjacent lymph nodes without other demonstrable tuberculous lesion were found in 44 of 279 college students or 15.8 per cent and in 79 of 452 medical students or 17.5 per cent. In ten of 45 instances of latent apical tuberculosis in medical students and in three of fourteen instances of manifest pulmonary tuberculosis in the same group, there was associated tuberculosis of the tracheobronchial lymph nodes.

With the lesions designated as latent apical tuberculosis there have been no symptoms of tuberculosis, and physical examination has revealed no physical signs. The number of these lesions has been practically the same in students of the four premedical classes and of the first year class in medicine. They increase in number considerably in the second year and slightly in the two subsequent years.

Students with manifest pulmonary tuberculosis have had symptoms such as coughs, hemoptysis, fever or loss of weight. Significant physical signs were râles, impaired resonance and restricted movement over the site of the lesion. Only one premdical student with manifest pulmonary tuberculosis was found.

One instance of clinically manifest tuberculosis was found in the first year medical class and none in the second year. In the third year class, however, there were four instances of pulmonary tuberculosis accompanied by symptoms or physical signs and in the fourth year class there were nine.

APICAL LESIONS

In Table III lesions found at the apex of the lung are classified in accordance with their extent. Shadows of doubtful significance, designated as suspected apical infiltration, were found in a considerable number of medical students, though it is uncertain whether these are due to tuberculous infiltration. It has been considered desirable to reexamine students with these anomalous shadows at repeated intervals.

In about 3 per cent of college students there was infiltration limited to the area above the clavicle, whereas 8.6 per cent of medical students had similar lesions, their number increasing from 3 per cent in the first year to 10 per cent in the fourth year. In some instances opaque salients project below the border of the second rib, and in all others there were some scattered shadows throughout the area above the clavicle.

Conspicuous pulmonary infiltration extending below the clavicle was not found in students of the first two years, but occurred in 6 medical students of the third year and in 13 of the fourth year.

The number of young adults with apical lesions of tuberculosis increases gradually with increasing age, but the incidence of these lesions in medical students, increasing rapidly in successive years of the medical course, with astonishingly high incidence in students of the fourth year, indicates that they are peculiarly subject to grave tuberculous infection.

FURTHER STUDY INDICATED

The results of this investigation, confirming, as they do, previous observations made at various medical schools concerning the development of clinical tuberculosis in medical students and internes, present a problem that requires further study. While the treatment of the individual patient differs but slightly from any other individual with a similar tuberculous lesion the cause of the high incidence of tuberculous disease in this group must be sought for and prevented.

"Tuberculosis in Medical and College Students"—H. W. Hetherington—F. Maurice McPhedran—H. R. M. Landis—Eugene L. Opie—Archives of Internal Medicine, Nov. 1931.

CHOREA GRAVIDARUM — A STATISTICAL STUDY OF 951 COLLECTED CASES: Prentiss Willson, M.D., and Alec A. Preece, M.D., Washington, D. C. (Arch. Int. Med., Vol. 49, No. 3, pp. 471-533, and No. 4, pp. 671-697, March and April, 1932). This is a complete and comprehensive review of 951 choreic pregnancies occurring in 797 patients. The frequency in U. S. Hospital cases is about one in 3,500, which would classify it as a rare disease. The majority of cases occurred in primipara and the average age was 22.4 years. A previous history of chorea was obtained in 60.9 per cent while 39.7 were associated with or gave a history of rheumatism. Definite clinical heart disease was noted in one-third of the cases, whereas autopsy revealed cardiac pathology in 87 per cent. There is a tendency to recurrence as shown by the occurrence of 253 choreic pregnancies in 99 patients. In 48.6 per cent the pregnancy was uninterrupted and terminated by spontaneous labor at term. The symptoms, complications and histopathologic findings are identical with those found in Sydenham's chorea. The mortality rate in patients having had previous attacks of chorea is considerably lower than the average mortality for all cases and is explained as possibly due to some developed immunity. The mortality in 749 patients was 18.1 per cent. The fetal mortality was 50.9 per cent.

Two important conclusions are drawn: First, that the chorea occurring during pregnancy is identically the same disease as Sydenham's chorea in adolescents, modified slightly, in certain respects, by its association with pregnancy. Second, that intervention or interruption of pregnancy is indicated in the case which is getting progressively worse, despite treatment, and should be done before fever, leukocytosis, etc., give evidence of active and generalized infection.

Russell J. Moe, M.D.

FOOD ALLERGY IN THE DIFFERENTIAL DIAGNOSIS OF ABDOMINAL SYMPTOMS: Albert H. Rowe (Amer. Jour. Med. Sci., April, 1932). Food allergy is not infrequently the cause of acute abdominal pain and vomiting and many other persistent gastro-intestinal symptoms. Surgeons as well as internists, therefore, must keep food allergy in mind in the differential diagnosis of all abdominal symptoms.

In an analysis of fifty of the records of a group of a hundred patients with such disorders the occurrence of the following symptoms was revealed:

	Per cent
Canker sores	20
Coated tongue	18
Heavy breath	14
Distention	32
Belching	20
Sour stomach	18
Epigastric heaviness	28
Burning or pyrosis	14
Nausea	40
Vomiting	30
Intestinal cramping	24
Mucous colitis	14
Diarrhea	12
Constipation	32
Proctitis	2
Pruritus ani	4
Pain and soreness in the epigastrium	20
In upper right quadrant	14
In mid-abdomen	10
In lower abdomen	20

The symptoms including weakness, fatigue, irritability, nervousness, mental dullness and confusion and generalized aching due to "allergic toxemia" from foods were present in a number of these patients. A family history of allergy was present in 65 per cent of the patients and a personal history of asthma, hayfever, cutaneous allergy or migraine was present in from 13 to 36 per cent.

It is well to remember that allergy produces two main reactions in tissues which give rise to its symptoms: (1) Edema of the mucous membranes and other tissues with the concomitant production of mucus and disturbed membrane permeability and, (2) Smooth muscle spasm which may occur in any tissue containing such smooth muscle from the bronchi or arteries to the gastro-intestinal or urogenital tract. Angioneurotic edema has been observed at operation for supposed obstruction. The mucous membranes and the abundant smooth muscle of the digestive tract, therefore, are natural sites for the establishment of allergic reactions from foods. It is probable that lesions similar to urticaria, erythema and even eczema in the skin may occur in the various parts of the gastro-intestinal tract.

Food seems to be the outstanding cause of allergic digestive symptoms although it is quite likely that allergic reaction to bacteria and other allergens than food may produce symptoms in various parts of the gastro-intestinal tract.

The symptoms have been classified under those related to the stomach which may be mild or severe and may occur immediately or be delayed one to three hours. Gastro-intestinal symptoms so frequently are associated with migraine and have been relieved through the elimination diet of Rowe, it is his opinion as well as that of Balyeat that most cases of migraine are due to food allergy.

The intestinal symptoms such as vomiting and anorexia as well as nausea may be due to food allergy which may arise from a disturbed peristalsis in the small intestine or in the stomach. Roentgen-ray studies of certain patients with gastro-intestinal allergy have revealed moderate duodenal stasis and reversal of peristalsis as well as hyperperistalsis and hypermotility.

The spasm and mucus of mucous colitis can be well explained by food allergy. It is quite probable that the so-called irritable bowel for which no satisfactory etiology has ever been presented often may be due to food allergy.

Abdominal pain and soreness may also be caused by food allergy. Allergic reactions in the cecum probably extend into the appendix and no doubt many appendectomies have been done because of allergic reactions in the colon and appendix.

Acute allergic reaction may be accompanied by fever, a leukocytosis of 12,000 to 20,000 although the polymorphonuclears are usually below 80 per cent. The symptoms that should suggest to the physician the possibility of allergy are:

A personal history of hayfever, urticaria, eczema, migraine or recurrent colds or cough and, in certain instances, of chronic gastro-intestinal symptoms. In such instances of chronic gastro-intestinal distress the family history likewise is important.

The history of definite food disagreement and dislikes should also suggest the possibility of allergy. Skin testing with foods should be done, although it is Rowe's experience that skin reactions are rarely of much help in the study of patients with gastro-intestinal allergy. Determination of food allergy therefore must be made with diet trial, such as his elimination diet.

R. Bardon, M.D.

PEDIATRICS

ATELECTASIS IN THE NEW-BORN: Ethel C. Dunham, M.D., New Haven, Conn. (Amer. Jour. of Dis. Children, March, 1932, Vol. 43, No. 3). Atelectasis in the new-born is the abnormal persistence of the condition of incomplete expansion of the lungs which is physiologic in the first few days of life.

The chief symptom of atelectasis is cyanosis, which may be constant or intermittent. The diagnosis of atelectasis can be made most satisfactory by use of the roentgenogram.

Atelectasis of the lungs in new-born infants is the abnormal persistence of the fetal state of the lungs due to some condition that interferes with the normal functioning of the respiratory center or to mechanical obstruction of the air passages.

Cyanosis due to atelectasis of the lungs can be differentiated from cyanosis caused by other conditions by means of roentgenograms.

The roentgenographic picture of atelectasis of the lungs in the new-born is characterized by haziness of the lung fields, which is evidence of lack of complete aeration, and by the abnormal shape of the thorax and the abnormal position of the ribs, which are evidence of incomplete expansion of the lungs.

Roentgenographic examination of the lungs is always indicated when a new-born infant is cyanotic.

R. N. Andrews, M.D.

LEMON JUICE EVAPORATED MILK IN INFANT FEEDING: Oscar Reiss, M.D., Los Angeles (Arch. Ped., Vol. XLIX, No. 3, March, 1932). The author's experience leads him to believe that lemon juice evaporated milk formulæ offer a type of infant food well suited for routine use in feeding of the normal baby during the entire first year of life. They compare favorably with fresh milk formulæ as to safety, digestibility, and nutritional value.

These formulæ are well suited for routine use in feeding of sick infants; and especially suited for the feeding of the under-nourished infants.

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Calories—26 per ounce

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Evaporated milk	14 ounces
Water	20 ounces
Karo	1½ ounces
Lemon juice	5 teaspoons

pH—5.61
Calories—21 per ounce

R. N. Andrews, M.D.

THE SURGERY OF THE UNDESCENDED TESTES: O. H. Wangensteen (Surg., Gyn. and Obst., 54:219, Feb., 1932). Author's summary: "The imperfectly descended testis is aspermatic because of its position. Prior to puberty the undescended testis is in every respect much like its normal fellow in the scrotum. The scrotum serves as a thermo-regulating mechanism, and in the adult only a scrotal testis is normal. The undescended testis is more likely to become malignant than is the normally descended one, and scrotal fixation does not diminish this increased predisposition to malignancy. The undescended testis, however, is not a precancerous lesion, and it is true that testicular malignancies are infrequent.

The procedure of election in the treatment of failure of descent is placement of the testes into the scrotum without injury to the testicular blood vessels. Adequate mobilization of the vessels of the testes (spermatolysis) is a significant and essential factor for the success of the procedure. In the operation of orchiopexy, temporary scrotal anchorage is an important detail of the technic. Without adequate scrotal fixation, retraction occurs, and growth of the testes commensurate with the normal does not obtain. A method to secure this end is described. The opportune time for the performance of the operation is between eight and eleven years; to insure a good functional result it is important that the operation be done before puberty."

C. A. Stewart, M.D.

LIPODYSTROPHIA PROGRESSIVA: Aaron Capper, M. D., Philadelphia (Arch. Ped., Vol. XLIX, No. 3, March, 1932). Lipodystrophia progressiva is a disease characterized by a symmetrical and progressive loss of the subcutaneous fat from the face, neck, arms, thorax and abdomen, with a relative abundance of subcutaneous fat over the hips, buttocks, and lower extremities.

The first case of this condition was briefly described in the eighteenth century by Morgagni, which was later mentioned by Zalla and Gugliemo. Sir William Osler observed a case in 1895, but published no record of it. The first complete and scientific description of this condition was by Barraquer from Barcelona, Spain, in 1906. The majority of the cases reported, over 50 per cent, originated in Spain. The muscular strength of the patient having lipodystrophia progressiva is unaffected.

On account of the normal blood cholesterol and the normal fat excretion in the stool, they feel that the difficulty does not lie so much in an inability to assimilate fat as in depositing it. It seems reasonable to suppose, therefore, that there might exist in the tissues of the upper half of the body a sort of negative chemotaxis for fat globules or an inability of the cells to take on fat as they normally did before this condition developed. There might exist a disease of fat tissue itself which interferes with the normal deposition and incorporation of the fat globules in the subcutaneous areolar tissues of the upper half of the body. Most of the reported cases occurred in females.

R. N. Andrews, M.D.

STUDIES ON INFLUENZAL MENINGITIS—THE PROBLEMS OF SPECIFIC THERAPY: H. K. Ward and J. Wright (Jour. Exp. Med., 55:223, Feb., 1932). The authors point out that influenzal meningitis is a disease of infancy and childhood and is usually fatal. Rivers found a mortality of 92 per cent in 220 cases reported in children under two years of age. Ward and Wright point out complement which is present in the cerebrospinal fluid in epidemic meningitis is absent in cases of influenzal meningitis. Bactericidal experiments suggest that the injection of a specific antiserum will have but slight lethal effect on the organisms unless complement is injected at the same time. Treatment with a mixture of specific antiserum and complement led to definite clinical improvement in some of their cases, coincident with sterilization and cleaning of the cerebrospinal fluid. After some days, however, the patients relapsed and died. Autopsy showed localized abscesses in the vicinity of the base of the brain, the lesions being definitely walled off from the general subarachnoid space. In one case the patient recovered.

Since the walls of the abscesses apparently present an insuperable mechanical obstacle to the action of the antiserum and complement, the need of early diagnosis in such cases whereby serum and complement may be employed for rapid sterilization of the cerebrospinal fluid before abscess formation occurs is suggested.

C. A. Stewart, M.D.

EFFECT OF DIGITALIS BODIES ON THE VOMITING REFLEX

A moderately toxic dose of digitalis bodies induces attacks of vomiting, which continue and become more intense as the dose is increased. The vomiting may stop for several hours and then recur after the drug has been discontinued. However, the vomiting may cease as the drug is continued and other toxic effects appear in the form of premature contractions of the heart or bigeminal rhythm. An experimental study undertaken to determine if it was possible for digitalis bodies to abolish this emetic action of the drugs, while at the same time increasing the extent of the cardiac poisoning, indicates that physicians should be cautious in relying on nausea and vomiting as a measure of the degree of cardiac poisoning. The continued use of large doses of digitalis bodies may depress the vomiting reflex and at the same time increase the intensity of the cardiac poisoning. (Jour. A. M. A., March 12, 1932, p. 893.)

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

An Experimental and Clinical Study of Pain in the Pleura, Pericardium and Peritoneum. Joseph A. Capps, M.D., Professor of Clinical Medicine, University of Chicago. 99 pages, Illus. Price, $3.00, cloth. New York: The MacMillan Company, 1932.

PRIMER ON FRACTURES. Illustrated. $1.00. A. M. A., Chicago, 1931.

Only the highest praise can be given in any review of the "Primer on Fractures" as its value as a guide in fracture treatment is inestimable. One feels that if a few pertinent facts regarding a fracture in any given locality are driven home, a medical meeting or scientific gathering is certainly worth while. The "Primer" drives these facts in by virtue of the clear-cut mottos or placards, and illustrations. Certainly every practicing physician should have this brief but valuable book.

G. A. Williamson, M.D.

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MINNESOTA MEDICINE

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PLACEMENT OF THE CHILD BORN OUT OF WEDLOCK: IS IT AN EXCLUSIVE PUBLIC FUNCTION?*

THE HONORABLE EDWARD F. WAITE
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Minneapolis

ONE of the most interesting social developments of all recorded time is the evolution of the Twentieth Century relationship of the State and the Child. Not only among savage tribes but in ancient civilizations the power of the father over the young child was supreme. He could mutilate, kill or sell into slavery at will. Organized government—when government began to be organized—took no heed.

When the State first interfered for protection its action was prompted by military considerations, and went no further than such interests seemed to require. In the early centuries of Christianity and throughout the Middle Ages the Church was the protectress of children: the State did nothing. In very modern times (and for us English-speaking people, through the decisions of the English High Court of Chancery—the "keeper of the king's conscience"—rather than through the law-making bodies) there developed the idea of the State's responsibility for the welfare of all citizens who by reason of infancy or other incapacity are unable to care adequately for themselves. This social and political concept of the State as ultimate guardian has now become as firmly established in the United States as any principle of law. It was recognized by the Minnesota Supreme Court forty years ago, and has been many times applied in later decisions of that court. With governmental duty goes, of course, governmental authority.

Whether we like it or not—and probably we all are satisfied with the principle, though we may not always agree on applications of it—it is the settled law of Minnesota that the state has the obligation to see, so far as practicable, that every child within its borders is protected in those interests which are commonly recognized as the fundamental rights of childhood; and the power to do what is reasonably appropriate to that end. To say this, however, is only to lay down a general principle. Whenever the principle is applied it is necessary to make decisions as to whether the particular child is or is not already having its welfare properly safeguarded; and if not, what ought to be done about it, who shall do this, and how. The limits within which these decisions are left to private or official choice are different in different states of the Union, according as the legislature has entered the field by the enactment of specific laws.

In answering the question to which this paper is addressed we must of course have regard to the laws of Minnesota. What laws have we to govern the placement of children born out of wedlock? Where lies the legal duty to execute these laws? What are the legally prescribed methods? When these questions have been answered it would not seem too much to hope that all good citizens will render obedience to the law as it is, even though they may not thoroughly approve of it. If it is wrong, let it be changed.

Sec. 4455 of the Minnesota Statutes is as follows:

> It shall be the duty of the board of control when notified of a woman who is delivered of an illegitimate child, or pregnant with child likely to be illegitimate when born, to take care that the interests of the child are safeguarded, that appropriate steps are taken to establish his paternity, and that there is secured for him the nearest possible approximation to the care, support and education that he would be entitled to if born of

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*Presented at the monthly meeting of the Hennepin County Child Welfare Board, April 8, 1932.

lawful marriage. For the better accomplishment of these purposes the board may initiate such legal or other action as is deemed necessary; may make such provision for the care, maintenance and education of the child as the best interests of the child may from time to time require, and may offer its aid and protection in such ways as are found wise and expedient to the unmarried woman approaching motherhood.

Section 4456 provides that "it shall be the duty of the board to promote the enforcement of all laws for the protection of" certain groups of handicapped children and among them the illegitimate; "to coöperate to this end with juvenile courts and all reputable child-helping and child-placing agencies of a public or private character, and to take the initiative in all matters involving the interests of such children when adequate provision therefor has not already been made."

The right to make complaint against the putative father is given to the Board; also authority to accept for the benefit of the child a settlement of the father's pecuniary obligation for the child's support.

What could be plainer than that the state intends to assert in the case of the illegitimate child its sovereign function of ultimate guardianship, to be exercised through the agency of the State Board of Control? When in any county there is a duly organized county board of child welfare, upon it develops the duty to represent locally the Board of Control in discharging the latter's statutory responsibilities in respect to illegitimates. Private corporations organized for the purpose of placing children in permanent homes must be approved by the Board of Control and all their placements are subject to the Board's supervision, including those made under contract, which are limited to the girl's sixteenth and the boy's eighteenth birthday.

But the law goes further than to declare its purpose and designate its agents. It prescribes methods. It provides for the licensing of maternity hospitals by the State Board of Control and for their supervision by that body in connection with local health authorities. It establishes a definition of maternity hospitals which includes all lying-in places operated for profit. It requires records, subject to official inspection, identifying the patient, the attending physician or midwife and any person who takes the child away for placement or adoption. It is made the duty of the licensee or person in charge to ascertain whether the child is legitimate, and to advise the Board of Control if there is reasonable ground to believe it illegitimate. It is provided that "no person, as an inducement to a woman to go to any maternity hospital for confinement, shall in any way offer to dispose of any child or advertise that he will give children for adoption, or hold himself out as being able to dispose of children in any manner." The mother, if in a licensed hospital, is required to nurse her child for three months, when possible.

One of the most important features of the revision of Minnesota's Children's Laws in 1917 was the elimination of the mercenary and unsupervised baby-farm. For these were substituted licensed boarding homes, subject to visitation by the Board of Control. Here again it is the duty of the licensee or person in charge to advise the board of such information as may be obtained relative to the legitimacy of the child. The power of either or both parents permanently to transfer custody of a child under fourteen years of age, otherwise than in a court proceeding, has been abolished; and whenever any parent—directly or through another person—has put a child in a private home with a view to permanent placement, and the arrangement has continued for more than six months, it is required that the Board of Control be given full information concerning the placement. It then becomes the duty of the Board to supervise the placement as it supervises those made by the State Public School or by incorporated and approved child-placing agencies, with power of removal if the home is found unsuitable.

An illegitimate child is declared to be *ipso facto* dependent, and as such within juvenile court jurisdiction. But the authority of the court cannot be exercised to take the child from the mother's custody without her consent, "unless, after diligent effort has been made to avoid such separation, the same shall be found needful in order to prevent serious detriment to the welfare of such child." In such case it can be done.

Our carefully safeguarded scheme for adoption provides for a preliminary investigation and report to the court as to the suitability of the child and the proposed foster home for each other, this report to be made by the State Board of Control; and in default of a parent or duly appointed guardian the Board is authorized to act *in loco parentis* in the matter of giving consent to adoption.

I have presented this abstract of statutory provisions in order that the policy of our state in respect to illegitimate children may clearly appear. It is evident—

1. That while the natural right of the mother to her child is recognized, this right is subordinate to the welfare of the child, which when the question is raised must be determined in court.
2. That no permanent disposition of the child can lawfully be made, by the mother or any other person or agency, otherwise than through a court proceeding, and that no relatively permanent placement can be made except by an approved organization, incorporated for that purpose.
3. That no placement of the child for longer than six months can lawfully be made, by the mother or any other person or agency, without the knowledge and approval of the State Board of Control.
4. That from its birth the child is treated by the law as a *de facto* ward of the state, subject to be formally adjudicated to be such whenever brought into court, and entitled to the protective oversight of the State Board of Control, exercised directly or through the local child welfare board, both in the mother's custody and wherever else it may be placed. Unreported placement is unlawful and subject to penalty as a misdemeanor.

On paper the scheme is quite complete, but it does not always work perfectly. The chief obstacle is the attending physician and especially the family doctor. In the old days the mercenary keeper of a lying-in establishment or baby-farm was permitted to dispose of the child as though it were a vagrant puppy, while Mother Minnesota stood idly by, seemingly heedless of the fate of the helpless little one. I have personally known of children being thus turned over to drunkards and prostitutes. This, thank heaven! is gone never to return. There is little trouble with the licensed hospital or crêche. Perhaps there is some bootlegging even in this field; but certainly not much.

In specifying as the chief obstacle to the perfect working of our statutory program the physician who attends the unmarried mother in confinement, I do not intend any reflection upon the integrity of the medical profession. If there are unprincipled doctors who dispose of unwanted babies in return for an addition to their fees, I do not now have them in mind. I am thinking of the kind and honest doctor who to prevent what he fears may be a scandal involving one of his families, or to relieve the distress of an unfortunate patient who suffers the pangs of maternity without any of its joys, and sees in her new-born child a threat of personal hardship beyond her courage to face,—who for these reasons assumes the function which the state reserves to itself, and privately places the child, directly or indirectly, for adoption in a home he believes to be a desirable one. Often, doubtless, he acts upon a friendly impulse, with little consideration. But if he stops to think is he not likely to say to himself something like this: "Why can't I do the job as well as some woman from the Child Welfare Board who never knew these people? I know the family history of the mother, either from my own observation or information from her on which I may rely; she has made me her confidant as to the father; I know the physical and psychological aspects of the case; I know the people to whom the child will go. Why expose the situation to the interference of officious outsiders?" These questions—perhaps very natural ones—I shall undertake to answer.

He ought *not* to make the placement—

1. Because of the spirit and letter of the law, which in unmistakable terms discountenances private and unsupervised placements and prescribes a different procedure, to be carried out through the state's officially responsible instrumentalities.
2. Because the welfare of the child ought to be the matter of paramount concern, to which—in the event of conflict—every other interest must give way. The moving thought in the mind of the physician is the interest of one or both of the parents, or the family connections of one or both. He does not mean to sacrifice the child, but that interest is not his first consideration.
3. The agents of the state are better equipped to choose a home for a given child, and a child for a given home, than is the doctor. I suspect that this view will not meet with universal favor among the medical profession, but I offer it as my deliberate judgment. Relatively permanent placement of children and the finding of foster homes has been for years a phase of social work which has been studied with special care. Standards have been worked out, discussed, tested and established by very intelligent and ex-

perienced groups. In Minnesota the task of applying these standards is and for many years has been in the hands of experts, with whose judgment, based upon painstaking investigation and specialized experience, the more or less casual opinion of even a wise and high-minded physician is not to be favorably compared. Child-placing is their business; it is not his. If it is not yet an acknowledged profession it is at least a highly skilled service, in which the novice —however proficient in other fields—is at a serious disadvantage. Does not the sense of propriety which has formulated a strict code of ethics to govern the relations of physicians among themselves, suggest that the legally defined province of the social worker ought not to be invaded?

4. If private placement is countenanced by high-grade physicians, it will certainly be practiced with increasing boldness and frequency by less conscientious members of the medical profession, to whom obviously it would be unsafe to delegate so important a function. What confidence can be placed in a wise choice of future parents when made by a physician whose standards of professional integrity permit him to begin his project with a false birth certificate,—a situation too frequently encountered in adoption proceedings?

I should be less than frank if I ignored a comment which quite naturally might be made by one familiar with the subject: There can be no adoption without a court proceeding, and there is opportunity then for an expert inquiry into the mutual fitness of home and child. The physician's placement is therefore subject to approval or disapproval by the constituted authorities. Is that not enough? No, for several reasons. The placement is sometimes in another state, and in that event Minnesota has no control of the situation. Even within the state there is no assured supervision of the child in the home, and much harm might occur, in the event of an unwise choice, before adoption proceedings are begun. The proposed foster parents may decide they do not wish to keep the child and all sorts of complications may result from this decision, in the midst of which the child is without an authorized protector. They may decide to keep the child without adoption, thus leaving him in an extremely disadvantageous status, as compared with what he would have had if suitably adopted. It is of great importance to the child that if possible the home in which he is placed otherwise than for temporary care shall be the one into which he is later to be adopted And when this is not possible, he should at least have his legal right of protective supervision by the state.

A point too frequently overlooked by physicians is that the policy of our state, for excellent reasons which I cannot now enlarge upon, favors the judicial establishment of paternity. This, in appropriate cases, is one of the functions of the local child welfare board, and it is often greatly hindered by premature and unreported placement. My experience satisfies me that there is little danger of the institution of proceedings ill-advisedly.

Again, the question whether a mother ought to keep and rear her child, or at least carry a share of responsibility for him while his future is being wisely planned, is sometimes of great importance to the mother, the child and the community. Private placement, which to fulfill its purpose must occur very quickly after birth, tends to forestall a deliberate answer to this question.

The interests of the foster home also call for careful deliberation and skillful guidance. Tragic situations arise when foster parents who have learned to love with truly parental fervency the child who has been committed to their care, find that he develops physical or mental defects, not susceptible of determination at birth or directly afterward, that disqualify him for their home. And sometimes a mother who has given to a private placement consent that has no legal sanction, changes her mind. Then follow confusion and distress, with inevitable disadvantage to the child.

The charter of children's rights put forth by the White House Conference of 1930, doubtless the most expert gathering of champions of childhood ever assembled, bespeaks "for every child a home and that love and security which a home provides; and for that child who must receive foster care, the nearest substitute for his own home." The laws of Minnesota seek, with wisdom and humanity, the fulfillment of this ideal. They should be faithfully obeyed. Placement of the child born out of wedlock is in Minnesota an exclusive public function.

To this conclusion there is an important corollary. When the State of Minnesota delegates to agencies of its own selection the vitally important task we are considering, no less than the utmost care should be taken to see that it is performed not only with good judgment, skill, and paramount concern for the welfare of the child, but with delicacy, tact, sympathy and due regard for all the collateral interests involved. Boards and organizations must work through individuals, who should be on their guard against a merely official attitude, and should never forget that they are human beings, dealing with the most intimate affairs of other human beings. In this field resentments are easily aroused and are likely to do much harm. "Friendly coöperation" should be the watchword; and here the physician may be—and is when there is mutual understanding—a most valuable ally.

ANGINA PECTORIS: MEDICAL TREATMENT*

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In opening the discussion of the treatment of this syndrome, I realize that every member of this Society is well versed in the use of the medicaments employed and in the individual variation of management, including prophylaxis, in any given case.

Assuming that the symptoms of angina are always due to an anoxemia of some portion of the heart muscle, the avoidance of this anoxemia is the primary requisite. The management of this, of course, depends on the individual case and its underlying pathology. All anoxemias of the heart must depend on faulty blood supply. The fault may be functional or organic. The functional deficiencies may be due to disproportion of muscle mass and aortic pressure, such as seen in some hypertensions, or due to a failing heart and an inadequate sinusoidal system[1] or again to anemia. The organic is due to disease of the coronaries, including aortic changes or valvular changes which may affect coronary pressure or occlude coronary orifices. The group due to muscle changes, such as scarring or fibrosis, are primarily coronary and can be included in the coronary group. Besides this there must be some nerve complex or "anlage" involved in the mechanism. All clinicians have emphasized the familial and racial variations back of this neurosis factor. The acquisition of tissue habits is lost sight of in our discussions of various syndromes. How a neurosis is grafted onto what may have been an accidental anoxemia is still not clear in the complex, but is strikingly evident in some veterans of anginal attacks.

With the introduction of the use of nitrites in angina pectoris by Lauder Brunton, it was long considered that the fall in blood pressure due to the peripheral dilatation was the instance which gave relief. The pharmacologic action of this interesting group of drugs has been enhanced considerably since his day. Of course we now know that their action in relieving pain is due to increased coronary flow, which permits a better metabolism in the site which instigates the attack. No better visible demonstration of this is afforded than the experiments of Fred Smith[2] of Iowa City ten years ago, working at that time in Chicago. Smith ligated a distal branch of the left coronary, gave his dogs nitroglycerine intraventricularly and saw the blanch area improve in color. He rightly assumed this was due to the dilatation of the collateral vessels. In dogs with poor collaterals no such change of color occurred.

The time of dilatation of the vessels after the use of nitrites varies in different parts of the arterial tree. The vessels of the skin of the upper part of the body, the meninges, the heart, and splanchnic area, dilate in the order named.

Wallace and Ringer[3] in 1909 gave the time in which various members of this group produce a fall in pressure as follows:

1. Amyl nitrite	3 mins. inhalation	3 minutes
2. Sodium nitrite	1 gr. in sol. by mouth	25 minutes
3. Nitroglycerine	1.5 mins. 1% solution by mouth	8 minutes
4. Erythrol tetranitrate	1.5 gr. in chocolate tablet	32 minutes

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*Delivered as part of the Symposium on Angina Pectoris at the meeting of the Minnesota Society of Internal Medicine, Nov. 9, 1931.

It has also been noticed that the faster the action, the shorter the length of time the pressure remains low.

The question of tolerance and cross tolerance to this interesting group has very recently been discussed by Crandall, Leake, Loevenhart and Muehlberger[4] of Wisconsin. Stewart[5] has previously reported a tolerance for 1 min. of a 1 per cent solution of nitroglycerine to 16 min. of a 10 per cent solution in 6 months. Laws[6] and Ebright[7] have demonstrated tolerance to nitroglycerine in workers in dynamite factories. Mathews[8] observed tolerance to nitroglycerine but none in patients given erythrol trinitrate, mannitol hexanitrate or to sodium nitrite.

TABLE 1

(Crandall, Leake, Loevenhart and Muehlberger)
Time required for production of tolerance to headache effects of one headache dose

Substance	Route	Total Time hours
Sodium nitrite	Oral	No tolerance
Erythrol tetranitrate	Oral	60
Glyceryl trinitrate	Skin absorption	38
Ethylene glycol dinitrate	Skin absorption	32
Methyl nitrate	Inhalation	24
Amyl nitrite	Inhalation	2-3

TABLE 2

(Crandall, Leake, Loevenhart and Muehlberger)
Amounts of "nitrites" required for production of tolerance to headache effects of one headache dose, calculated on the basis of one headache dose glyceryl trinitrate = 10 mgm.

Substance	Route	Amount mgm.
Sodium nitrite	Oral	No tolerance
Erythrol tetranitrate	Oral	216
Glyceryl trinitrate	Skin absorption	52
Ethylene glycol dinitrate	Skin absorption	160
Methyl nitrate	Inhalation	Not measured
Amyl nitrite	Inhalation	102

They observed that cross tolerance from one for the other of the group is easily obtained. Tolerance to sodium nitrite is obtained, but sodium nitrite develops no tolerance for the others.

The time required to develop tolerance to a given ester is remarkably constant. The amount of ester taken during the production of tolerance varies with the individual. The higher headache dose required, the larger amount needed for development of tolerance. The evidence for tolerance points to some chemical factor. Physiological habit is not the answer since these people all responded to histamine. Tolerance could be kept up by using one headache dose a day. Tolerance to headache is more easily established than tolerance to blood pressure and pulse variations.

The toxicity of glyceryl trinitrates and sodium nitrite has been reported from the same laboratory by Oltmann and Crandall.[9] Rabbits injected intravenously with these two drugs invariably died by the use of 45 mgm. of nitroglycerine per kilo of rabbit and 80-90 mgm. of sodium nitrite per kilo of rabbit. In the former, death ensued in 20 minutes; in the latter, in a little over an hour's time. The death was one of asphyxia.

The difference in lethal dose indicates that the nitrite ion in nitroglycerine is not wholly responsible for the toxic effect. Assuming that the same type of hydrolysis occurs in the body as in vitro, 27.3 mgm. of sodium nitrite liberates as many nitrite ions as does the lethal dose of nitroglycerine. The lethal dose of sodium nitrite is approximately three times as large as would be expected if both compounds acted only by the liberation of nitrite ions. The asphyxia is either due to fall of blood pressure or to the formation of methemoglobin. Haldane was enabled to protect mice against the lethal dose by keeping his animals in an air oxygen chamber. "It is probable that other factors enter into the cause of death by these substances but evidence would go to show that asphyxiation is at least one of the more important causes."

A paper presented by Sturgiss, of Providence, Rhode Island, before the American College of Physicians last March (1931) and published in the Annals of Medicine should be read by all students of the use of nitrites. He summarizes his observations as follows (he is discussing "The Reaction to Nitrites on the Anginal Syndrome and Arterial Hypertension"):

1. "Except for a very transient fall in blood pressure after amyl nitrite, neither it, nor nitroglycerine, when used in the usual therapeutic doses, causes any consistent blood pressure changes in normal human beings or in persons with arterial hypertension with or without severe renal damage or retinal arteriolar sclerosis.

2. "The fall occurring after the use of amyl nitrite is so rapid and transitory and so independent of subjective symptoms that it is impossible to measure it accurately by taking blood pressure determinations in the ordinary way. This fact greatly decreases its usefulness in estimating the prognosis in arterial hypertension.*

3. "In persons suffering from attacks of an-

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*The last sentence is a refutation of an assumption made by Steiglitz, E. J., Arch. of Int. Med., 1930, xlvi, 227, who thinks that by means of nitrites a prognosis in hypertension can be established.

gina pectoris of the usual ambulatory type, a rapid fall in systolic and diastolic pressure takes place after the use of these drugs.

4. "The pain relief which occurs in these cases of ambulatory angina is independent of the pressure levels and therefore independent of the action of the nitrites on the peripheral vessels but due to their action in increasing coronary circulation."

The prevention of anoxemia in a progressive condition is the dilemma in which we find ourselves continually in the management of the syndrome, for which reason the slower acting nitrites have been used for years. The difficulties encountered in their use have been hinted at under the discussion of tolerance and toxicity. I have seen nothing in the literature relating to studies in methemoglobinemia in anginal cases.

Of late years the vegetable purins or xanthin bodies have had vogue in combating the anoxemia. Beginning with caffein, theobromin and its derivatives, theocin and its modifications, particularly euphyllin, have been much vaunted. The experimental evidence is that theobromin and theocin and their derivatives dilate the coronaries. This has been demonstrated on cats and rabbits usually in the heart-lung preparation or the perfused heart. Clinically they have had a measure of success. The selection of the case by trial and error is our only means as yet to judge their use.

Wedd,[10] working in Cambridge, recently reports adenosine is a most powerful dilator of the coronaries in the perfused heart of the rabbit. The dilatation is independent of rate and action of the heart muscle. It is about twenty times more powerful a dilator than is sodium nitrite, not only in dilating normal vessels but also those which have been constricted by pitressin or barium chloride. The hearts of animals suffering from hypervitaminosis due to feeding an excess of Vitamin D showed an enormous reactivity to adenosine, expressed by a tendency to become more reactive in a state of dilatation much earlier than did the vessels of normal hearts. The type of reaction could not be correlated with histological changes.

Adenosine is a pyrimidin glucoside made from yeast nucleic acid. It is related to adenylic acid and guanosine. All three are liberated just like histamin in tissue injury. However, they differ from histamin in not producing wheals on intradermal injection. Adenosine practically duplicated the action of amyl nitrite. Unfortunately, it has besides this an action on the conduction system and muscle cell of the heart which precludes its use as a coronary dilator.[11] I have seen no reports on its use in angina pectoris.

Glycocyamine, worked out by Major of Kan-City as a depressor of blood pressure, has been shown to increase coronary flow experimentally.[12] Glycocyamine is a guanadin acetic acid and closely resembles creatin, from which it differs in having no methyl group. I have seen no reports on its use in angina pectoris.

Since the days of Heberden, alcohol has been used to prevent and relieve attacks of angina. How alcohol acts is still a mystery. That it is still a drug to conjure with cannot be denied. I am favorably impressed by its action in the group of milder cases.

Up to now we have attempted to improve coronary flow by means of pharmacologic methods. Recently two other methods have been used to relieve pain and prevent attacks which approach physiological processes. The use of oxygen in the familiar oxygen chamber or tent, or even the nasal catheter method, has been used by Barach[13] of New York City. Barach reports the treatment of three cases of rather severe coronary disease and chronic pain by this means. They were kept in tents for periods of ten days to two weeks. One received supplemental nasal catheter inhalations for eight hours a day for six weeks. Pain was relieved and the attacks were minimized.

The mechanism which relieves pain in this syndrome or following coronary occlusion is not clear. I trust Dr. Rizer,[14] who has treated twenty-eight cases of coronary occlusion by means of oxygen, which tell us about his experiences. Barach states in his blood gas studies that he was enabled to raise the arterial saturation from 95 to 99 per cent. "Although this represents a small increase in per cent saturation it indicates a very considerable rise in the tension or partial pressure of oxygen available to the tissues." This may be the reason for the relief of the local anoxemia in the heart muscle. Further in his discussion of the rôle of oxygen in the treatment of cardiac decompensation, he notes that his blood gas studies indicated a marked rise in CO_2 in the arterial blood. Is it not possible that the use of CO_2 in the arterial blood locally may act as a vasodilator and relaxer of cardiac muscle, thus adding its influence to the factor of increase of partial pressure of oxygen in the relief of pain?

A better understanding of this point is afforded by the discussion of Yandel Henderson's suggestion[15] of the use of CO_2 in the treatment of angina pectoris. He calls attention to the need of CO_2 in the perfusates in heart preparations in order to prevent tetany; to the dilatation of the skin vessels after hyperventilation by means of CO_2. It is his opinion the good results of Nauheim baths in heart disease were probably due to the inhalation of the CO_2 volatilized from the water rather than the stimulation effect on the skin.

By means of an open face mask a slight degree of hyperventilation is obtained by means of a 5 to 7 per cent CO_2 mixture with air. The usual hyperventilation apparatus can be used for this. He claims pain can be relieved, and by daily use the same reaction in the tissue vessels can be induced as is brought about in the healthy person by a walk. In his theoretical consideration, he makes these points. In a given acting muscle if the oxygen supply is adequate the accumulating waste products are burned to CO_2. The excess of lactic acid and deficiency of CO_2 in a poorly-nourished muscle produces ischemia and cramp. CO_2 is a powerful relaxer of muscles. A muscle to function properly must be able to relax as well as contract. Hence CO_2 (quoting Miescher) "spreads its protective wings over the oxygen supply of the body." A patient inhaling CO_2 at regular intervals for fifteen to twenty minutes is providing himself with a reaction which daily exercise gives to the normal individual. He develops increased local capacity for strain and normal behavior. His tissues lose a "habit." Henderson has had experience with three cases of angina. His conclusion is "that daily inhalation of CO_2 appears to offer a possibility of considerable amelioration of the crippling effects and suffering in cases of angina pectoris and also intermittent claudication."

In one case treated by this regime in Minneapolis, no success was obtained. This may be due to its advanced condition and an exquisitely sensitive neuromuscular arc.

Why do we fail in certain cases?

1. The possibility of an exquisite nervous arc. The only drug which will control this is morphin.

2. The impossible adjustment between the progression of sclerosis and compensatory growth of collateral circulation.

3. The possibility of a factor in the sinusoidal system.[1]

Based, as is this syndrome, on a progressive feature the prognosis is extremely variable. Instances of death in the first attack to instances of persons living twenty-five to thirty years after their first attack, are on record. Herrick[16] in 1916 gave the average length of life after the first attack as 3 years; MacKenzie[17] in 1923, as 5.4 years; and Paul White[18] in his recent Monograph on the Heart, as 4.6 years. There are individuals who outlive the syndrome. The possible explanation for this is that they have hearts which have developed an adequate collateral circulation.

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MORE FALLACIES IN THE TREATMENT OF RECTAL DISEASE

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ALTHOUGH the origin of the method of treating piles by injection is more or less dimmed by antiquity, it is said to have been devised by a blacksmith. It is perhaps with a laudable attempt at a revival of the old days of craftsmanship wherein each man was so skilled in the arts as to be sufficient unto himself that the flame of scientific interest is being kindled in the minds of not only osteopaths and chiropractors, but (sic!) dentists as well. Possibly too wide a diffusion of proctologic knowledge has the same effect as the spreading rays of the late afternoon sun in mid-winter when it so happens that no one area gets enough of the beneficent rays to do any good. At any rate . . .

Each time the good Dr. Brady reveals to the panting proletariat the mysteries of the injection treatment of hemorrhoids he takes his final bow with the good-natured remark that any good doctor can furnish the above-named treatment. I frequently find myself—perhaps unwillingly—agreeing with this oracle of medical wisdom; possibly equally as often I am conscious of a slight feeling of skepticism, while occasionally I take violent exception to his opinions. His statement that any good doctor can inject piles stands without challenge, provided, of course, that it be recognized that no one ever was capable of doing it by pure instinct, as a cat swims when tossed into the water, but only by learning what to inject, when to do it, and what to do with. Increasingly of late I have been seeing cases in which the hapless sufferer has been injected, sometimes apparently with harshly irritant solutions, all along the route from a point one and a half inches external to the anal orifice, to the level of the recto-sigmoid junction. Obviously, to accept a fee for such treatment is *schrecklich.* In the manner of Samuel Johnsons's comment on the woman preacher, the surprising thing about it is not that it is done badly (one expects that) but it is remarkable that one does it at all . . . without bothering to learn how. I still agree with Dr. Brady when he says that any good doctor *can* inject piles.

It may seem superfluous to repeat what has been said so often on this subject, but experience proves that the advice has not been completely assimilated, and that is, that *only internal hemorrhoids are to be treated by injection.* Having gotten this axiom firmly fixed in mind, the next requisite is the ability to differentiate one type of pile from another. This should not be an insurmountable difficulty, but again, appearances are to the contrary.

If one recalls the embryological development of the rectum he will doubtless remember that the rectum is formed by a prolongation and pushing down of the blind hind-gut, while the anus is made up of the inpouching of the proctodeum. In the embryo the hind-gut and the proctodeum advance toward one another, finally breaking through the septum and coalescing to form a continuous tube. The point where the epi- and hypoblastic layers meet, the junction between body-wall and viscera, is known as the pectinate line. This extremely important landmark defines the distal boundary of the intestinal canal and is the dividing line between the internal and external sphincters. Internal to it is columnar epithelium, while below, or distal to it, the epithelium is squamous in type. Above the pectinate line the superior hemorrhoidal artery supplies the rectal mucosa, below it the blood-supply comes from the inferior hemorrhoidal. This line divides the caval and portal circulation. The lymphatics on the distal side drain into the inguinal nodes; those on the proximal side into the sacral and lumbar nodes. Tactile corpuscles are only found distal to the pectinate line, hence the lack of pain on injecting the mucosa immediately above it. This importance of this region can not be over-estimated from a proctologic standpoint since probably 80 per cent of the troubles seen by a proctologist are along the pectinate line.

After a little experience and study one is able to distinguish the various anatomical and pathological structures which occur here, and to make a proper evaluation of their importance. The line may be identified by the anal papillæ, the distal ends of the columns of Morgagni, the distal extremities of the anal crypts between the columns, and the type of epithelium. *Injection of hemorrhoids must be made proximal to the pectinate line.*

Even if one is not yet sufficiently familiar with the normal antomy of the anal canal to make out these smaller landmarks, he may always distinguish the internal from the external pile by the fact that the former is covered with soft, reddish, velvety, moist mucosa (columnar epithelium), whether the pile happens to be inside the anal canal or outside, while the external variety is covered with skin or transitional mucosa.

If the above appears unnecessarily detailed let me say that recently I saw a patient who had received two injections into the center of a tremendously thrombosed external hemorrhoid. Needless to say, this treatment failed to contribute in any great degree to his peace of mind. Another patient had three injections which resulted in fairly large ulcers in the rectal wall at a point four or five inches above the sphincter. It so happened that I had seen this particular gentleman some six months before and informed him—albeit sadly—that he had no piles, but persistence won out, and he finally succeeded in getting treatment. A third patient had the smooth, non-ulcerated and nodular margin of an undiagnosed carcinoma of the ampulla injected several times. In a procedure that is as easy to learn as the injection of piles this sort of thing is hardly excusable. The time has passed when surgical experience must needs be gained by main strength and awkwardness.

A part of the difficulties encountered has been from the use of improper solutions, or the incorrect use of satisfactory solutions, although I believe that the trouble from this source is likely to be a minimum. Montague in his "Modern Treatment of Hemorrhoids" lists some thirteen or more solutions, most of which utilize phenol as the active agent. Phenol solutions in proper strengths are used throughout the country by all proctologists, and are safe in experienced hands. In my own work I have continued to use quinine and urea hydrochloride in a 5 per cent dilution, except in the occasional refractory case, when I make use of one of the carbolic acid preparations. I am convinced that quinine and urea hydrochloride is the safest solution for the beginner or the occasional user, since one rarely has trouble from the solution *per se* when employing this material. The amount to be used varies with the size of the hemorrhoid being injected, from 0.5 to 1.5 cubic centimeters. Again quoting Dr. Brady, any good doctor can successfully inject hemorrhoids . . . if he learns how, and this should not take long nor require any great effort.

The second topic which I wish to discuss briefly is that of carcinoma of the rectum and its oftener-than-not attendant colostomy. I presume that if asked whether or not they would submit to a colostomy in the event of their being unfortunate enough as to have a rectal cancer, eight out of ten doctors would reply in the negative. To me this is in some ways an extremely curious reaction. It is, of course, a typical example of entirely biased judgment, and should be accepted as such. Naturally an individual in the perfect glow of health, a doctor on the way to the golf links, a person who is in the habit of occupying his spare time with more or less athletic diversion, looks with some repugnance on what would appear at first thought to be a nuisance,—an anus in an unusual location. For after all, that is all a colostomy is,—an anus somewhere else.

Put the doctor in the position of the cancer patient, who has a painful, ulcerating, bleeding, partially obstructing growth, and who has ahead of him nothing other than months of suffering, and I venture to say he will choose the lesser of two evils, if colostomy must be termed an evil.

It is all very well to be dogmatic concerning someone else's carcinoma. The unsavory reputation which has become attached to a permanent colostomy is due, I believe, to several factors. First, as has been noted above, a natural, first-thought dislike for an unnaturally placed anus; secondly, indifference on the part of the attendant surgeon after the colostomy has been made, with the result that the patient is finally forced to make use of whatever ingenuity he might have in finding the way out of the minor difficulties surrounding his hygiene, usually ending up with some makeshift appliance of home manufacture; third, a lack, in the profession in this vicinity, of acquaintance with what has seemed to me a thoroughly satisfactory colostomy appliance.

A colostomy retainer of any type functions satisfactorily only when the stools are moderately formed, since nothing so far has been devised which will retain, for any length of time, a liquid stool. Thus the matter of keeping the bowels slightly constipated is important in the use of the belt under discussion. The appliance we have been using for six years has proven satisfactory from all standpoints. It is constructed of a wide strip of elastic material five or six inches in width, adjustable, and which fastens by means of "lift-the-dot" fasteners to a light metal plate which has an opening in the center. A canvas "hat" with a stiff brim and a soft, collapsible crown is slipped through the opening in the plate with the stiff brim between the plate and the abdominal wall. The brim holds the hat, or bag in position while the crown pouches out through the opening in the plate where it lies collapsed and flat until needed to retain the stool. The hat is first lined with paper which is waxed, then with absorbent paper, and then placed over the stoma, where the pressure of the clothing keeps it flattened out and invisible through the clothing. The entire belt is washable, and may be sterilized by boiling, there being no rubber parts to deteriorate. The cost is in the neighborhood of seven dollars.*

I am certain that the inconvenience resulting from a permanent colostomy is greatly exaggerated in the minds of many physicians. Lockhart-Mummery[1] says: "The best way to estimate the disability of patients operated upon for rectal cancer is in reference to the wage-earning capacity. We feel that this is not diminished except in the case of very heavy labor involving strenuous exertion. The majority of the patients (in his list) were still in the same employment as formerly; thus out of twenty cases apparently cured by operation, six were women, five of whom did their own housework, one was a stationer's assistant. There were fourteen men, of whom ten were in full work in the following occupations: printer's cutter, fish-curer, tailor, packer, schoolmaster, pilot, messenger, waiter, plate-layer, and odd-job man. Three were living in retirement, being over sixty-five years of age."

The same author[2] says: "The disability (colostomy) is not a serious one, in fact not nearly so serious as might well be imagined. Patients are able to live comfortable and useful lives, and after the first few months it is remarkable how little inconvenience the colostomy causes."

In discussing the various types of colostomies Rankin[3] says: "The fact that practically any type of stoma may be attended to easily so long as the bowels remain constipated renders the results of colostomy satisfactory in the majority of cases."

Daniel F. Jones[4] states: "After seeing a large number of patients with colostomies, we have been convinced that they can and do live happy and contented lives and do their usual work. A colostomy gives them the best possible chance for life and for a permanent cure."

As to the skepticism regarding the treatment of cancer of the rectum by radical excision and permanent colostomy, and the dubious outlook shared in by so many physicians toward its cure, I repeat what Yeomans says, that in the present state of knowledge of the therapy of intestinal carcinoma, it may be stated as an axiom that the removal of the growth by radical surgery is indicated in all operable cases, and irradiation in all inoperable cases.

The surgeon is going to continue to be hopelessly hampered in the treatment of this condition unless he has the coöperation of the physician, and if the physician is not on the lookout for early cancer, and if he does not believe in the efficacy of its radical treatment in those cases requiring it, it is quite obvious that a large number of unfortunates are going to die each year from carcinoma of the rectum, whose lives might otherwise be saved or lengthened indefinitely.

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*The belt described is made by John F. Greer, 2242 Telegraph Ave., Oakland, Calif.

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RADICAL SINUS EXENTERATION IN PANSINUSITIS*

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FIFTY patients with a diagnosis of pansinusitis were operated on with a complete exenteration of the nasal sinuses, first opening into the antrum through the cheek, as in a Caldwell-Luc operation, and then through the roof of the antrum into the ethmoids, frontal and sphenoid, removing the entire floor of these cells and very thoroughly curetting the frontal, ethmoid and sphenoid cells. The bony wall between the nares and antrum was also removed, leaving the middle and inferior turbinates as two ribbons or bands stretching across between the nasal cavity and the antral cavity. Hypertrophied turbinates, especially the inferior turbinate, can be made smaller by biting off along the previously attached portion of the turbinate. This operation[1] was first performed by Uffenarde in 1912, who found he was not able to prevent the reformation of polypi after a complete intranasal ethmoid exenteration. Also, the external ethmoid and frontal exenteration did not stop the recurrence of polypi, but by attacking the ethmoids through the antrum he was able to stop their recurrence. This operation is also performed by Sewall[2] of Stanford University, who advises first performing such operations as tonsillectomy and septum removal, and then waiting quite some time before attacking the sinuses, as many cases will then clear up. My previous check-up by questionnaires on the results of septum resection has shown that 42 per cent will respond to septal resection alone.[4]

An analysis of fifty cases of pansinusitis submitted to the Caldwell-Luc and ethmoid operation as above described was made, the operation having been performed three years or more ago, thus allowing for considerable time to have elapsed in order to check the end-results.

Of the fifty cases, twenty-nine were recorded as cured, eighteen improved, and three not improved. None was made worse.

ANALYSIS ACCORDING TO SYMPTOMS

Discharge.—Of twenty-one patients with this as a major complaint, eleven were recorded as cured, eight as improved, and two as not improved.

Nasal Blockage.—Of eleven cases of polypi, there was no recurrence following operation. In fourteen cases with blockage from other factors than polypi, thirteen were recorded as improved, and one not benefited. However, many of these cases also had septal resections, especially where there was any marked deviation of the septum.

Focal Infection.—Eleven patients were operated upon primarily to benefit some condition dependent on an infection focus as a causative agent. Of this number ten showed some degree of improvement, and one showed no improvement.

Bronchiectasis.—All of the four patients reported some improvement. One improved very much with lipiodol treatments following the operation. Another improved much after pneumothorax collapse therapy.

Bronchitis.—Two of the four cases, of rather mild degree, were cured, and two were improved.

Asthma.—In all of the five cases nasal symptoms were improved. One patient was cured. One was very greatly improved, handling dusty hay only giving him any difficulty. Two patients felt that they were some better. One, who did not have any nasal symptoms, although the sinuses were all crowded with polypi which had not as yet protruded into the nasal cavity, was not improved. Follow-up treatment with vaccines, lipiodol, etc., will greatly help many of these.

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*From the Duluth Clinic. Read at meeting of Minnesota Academy of Ophthalmology and Otolaryngology, April 8, 1932.

Emphysema.—One patient was very greatly benefited and two much improved by the operation.

Headache.—There were ten patients in all who complained of headaches of some degree. Of this number six were relieved completely, three were improved, and one reported still an occasional headache.

Of the fifty patients, nine had had previous nasal operations, two having had a Caldwell-Luc operation with no benefit. Three had had tooth extractions, but the other sinuses were also diseased, and three of the patients complained of some local pain in the cheek.

CONCLUSIONS

When the disease is confined to the sinuses the results of the operation are very good. Where there is a complicating bronchitis of not too long standing, or too much pathology has not already developed in the bronchial tree, the results are also gratifying. In cases of bronchiectasis improvement is more likely in conjunction with lipiodol injection. Vaccines, drugs, climate, etc., are quite important.

Asthma itself may not be much influenced, but the nose is made much more comfortable. Here, follow-up treatment is very essential. This operation seems to completely cure polypi, as in no case in this small series has there been the recurrence which usually follows other methods of polypi removal or sinus operations. The exception, of course, are the primary polypi, which arise from the middle turbinate or furrows in the middle turbinate, and which are cured by simple removal. Polypi arising from a sinus are called secondary polypi, being secondary to an infection in that sinus, usually of the serous catarrhal type. Empyema of a sinus is not usually followed by polyps.

The advantages of this type of operation are as follows:

1. The complete operation is performed at one sitting, thus eliminating the necessity of repeated curetting of the ethmoids sometimes required after the operation by the intranasal route. This is of economic importance, especially to patients coming from a distance.
2. A full view and inspection is possible of the entire ethmoid labyrinth and sphenoid sinuses and even into the frontals to some extent, so that thorough removal of all polyps and necrotic tissue can be accomplished.
3. One large sinus cavity of the antrum, ethmoid, frontal and sphenoid sinuses is created on each side, providing a very complete drainage and ventilation for any acute infection that may subsequently develop.
4. While this operation may seem like a formidable procedure, it is not in the least mutilating. The intranasal appearance of the nose, including the turbinates and septum is all perfectly normal. None of the patients have complained of any dryness, crusting or discomfort from the inhalation of cold air.
5. The advisability of caring for the chronic cases of pansinusitis before bronchiectasis, asthma, or other serious complications develop, is imperative, if the best results are to be obtained from the operation.
6. This operation is advised for cases only of pansinusitis with extensive involvement, where simpler methods of treatment are not indicated.

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LIPIODOL AS A THERAPEUTIC AGENT IN ASTHMA

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THE instillation of lipiodol into the tracheobronchial tree as a diagnostic procedure is well known and its value in confirming clinical chest findings is well recognized. The value of lipiodol, however, as a therapeutic agent in the treatment of bronchial inflammations is apparently appreciated by few.

For the past two and one-half years I have been using lipiodol as a routine therapeutic procedure in the treatment of chronic cough, bronchitis, bronchiectasis and asthma, excepting in such patients as exhibited a contraindication to the iodine content of the oil. Ochsner in 1929 reported his observations in a large number of patients suffering with chronic bronchitis and bronchiectasis and his reports of the marked improvement in their clinical symptoms following the introduction of lipiodol have been borne out in my series. The case histories which I report in this paper are those of patients whose chief complaint was the phenomena exhibited in asthmatic attacks.

Subacute and chronic affections of the bronchi are frequently encountered and the treatment is often unsatisfactory. This unsuccessful treatment is not surprising in view of the fact that little if any direct treatment of the bronchial mucous membrane has been attempted. Bronchography offers a method of direct treatment and the improvement in the clinical symptoms following the introduction of lipiodol into the bronchial tree impresses one with the therapeutic possibilities of this form of treatment.

In bronchitis and bronchiectasis I found the instillation of lipiodol to be of unquestionable value. The improvement in the clinical symptoms manifested itself by decreased cough, decreased sputum, disappearance of the foul odor, and increase in weight.

The improvement in the clinical symptoms of a patient suffering from bronchitis following bronchography varies to some extent, depending a great deal upon the duration of the disease and the extent of the pathological change in the bronchial walls. My observations would indicate that in those patients where the disease has been of comparatively short duration there is more likelihood of prompt relief, while those who have suffered for years require repeated instillations.

The subacute cases may have as the only symptom a chronic cough, bronchography showing no dilatation of the bronchi and the chest findings being negative. Two of my series were of this type and both obtained prompt relief from one instillation. It is usual, however, to have more or less definite chest indications and slight dilatation of the bronchi revealed in bronchography. Nevertheless, the fact that cough is so often the only symptom warrants the instillation of iodized oil in spite of negative physical findings. Ochsner has reported finding dilatation of the bronchi on the first instillation and absence of it on repeated instillations. He classifies this type as functional. I have not observed this phenomenon.

The chronic cases differ from the acute in that the pathological change in the bronchial walls is more extensive. It is to be expected that the improvement obtained would be in proportion to the degree of these changes. This I found to be true. The amount of relief attained is variable in degree and duration. For this reason no set routine can be established by arbitrarily fixing the time of the next treatment. This is an individual factor and depends upon the character of the bronchial changes. It is my procedure to allow the patient to follow his own inclinations in the matter. It is better, however, to keep in touch with him for the first month to learn the effect of the instillation. If no improvement is obtained, relief is often obtained by a second filling. It is not to be expected that one or two treatments will effect permanent relief. It does not eradicate the disease but only improves the symptoms. In bronchiectasis the improvement is not so satisfactory. There is, however, a sterilization of the cavities and consequent decrease of the foul odor.

Probably the most interesting cases in my series were those in which the asthmatic phenomena played a prominent part.

These cases are presented simply to call attention to a therapeutic procedure which may prove useful in the treatment of bronchial asthma when all demonstrable etiologic factors have been eliminated and other procedures have failed. The number of cases observed is too few to definitely fix the therapeutic value of lipiodol in the treatment of bronchial asthma but in view of the results obtained it promises to establish a definite place for itself.

Due to the fact that concrete data concerning the cause of bronchial asthma are lacking, it is difficult to explain the specific action of the lipiodol. In spite of assertions to the effect that lipiodol is not broken down and therefore no iodine effect could be produced, it is probable that its action is upon the membrane itself and is not concerned with any reflex adjustments. One must suspect, however, after frequently noting the disappearance of foul odors that it has some sterilizing attribute. Whether this is due to a slow evolution of iodine or some other factor is difficult to say. It has been demonstrated that the urine shows constant traces of iodine as long as lipiodol is present in the tracheobronchial tree. Whatever the mechanism, it is probably similar to its action in bronchitis. Jackson, who has examined, bronchoscopically, asthmatic patients both during attacks and between attacks, calls attention to the fact that many of these patients have a chronic tracheobronchitis. It is possible that the benefit derived is due to the action of the lipiodol on the chronically inflamed membrane.

Robertson gives the following interesting explanation of the probable action of lipiodol: "It is known that iodine is used chemically to determine the so-called iodine number by virtue of its chemical affinity with the fats. Its use internally in the body may possibly be explained on this basis since we know that protease is mobilized only when fatty acids are linked up and not free. Iodine may unite with fatty acids and liberate protease, thereby producing a beneficial action in that the undesirable necrotic or destroyed proteins are gotten rid of as exudates and the fibrin is better able to perform its function of healing. Lipiodol may exert its beneficial action in the bronchi by virtue of the liberation of nascent iodine, which in turn may improve locally the condition of the bronchial and bronchiolar walls with which it comes into contact."

For this reason lipiodol at present must be considered as an adjunct in the treatment of bronchial asthma. That it may have a specific effect and can be used routinely in all types remains to be seen. Many more patients must be observed before one can say whether or not it will help those asthmatics not having the complication of a chronic bronchitis. Its use is indicated in those cases of bronchial asthma which have been carefully studied from all standpoints, especially as to hypersensitiveness, focal infections (particularly those located in the nasal accessory sinuses), cardiac and renal disease, and other organic conditions, and have not responded to treatment.

Lipiodol can be introduced into the tracheobronchial tree by several different methods. Essentially there are but two: the bronchoscopic, which is probably the most accurate and satisfactory; and the procedures which allow the lipiodol to flow into the bronchial tree through laryngeal instillation. Various procedures are used in this latter group but all are based on laryngeal introduction.

Bronchoscopic instillation possesses distinct advantages in many cases. First, it can be employed irrespective of the patient's age. Laryngeal instillation in the young presents problems which are difficult to overcome. Second, it allows the medication to be accurately placed in any region of the bronchial tree which presents clinical signs. This advantage, however, is more apparent in diagnostic instillations than in the therapeutic. It is surprising how readily the lipiodol can be made to enter a particular branch bronchus when the correct technic is used in the passive instillation. Third, it enables one to properly anesthetize the mucous membrane of the tracheobronchial tree and thereby lessen the irritative effect of the medication which is often present following the instillation. Fourth, the bronchoscope allows the removal of secretions preliminary to the introduction of the oil. This is a very important and distinct advantage and the demonstration of secretions definitely indicates its use. These secretions are often of a purulent type but for the most part are mucoid in character and are often very tenacious. Medication is apt to produce little effect if the smaller bronchi are plugged. It has been demonstrated that the removal of such secretions often materially benefits the asthmatic patient.

When laryngeal instillation is employed, I have found the passive method the most satisfactory.

It is not complex, is quickly done, and is efficient. Repetition of the procedure at frequent intervals is not viewed with alarm by the patient. This is a necessary attribute of any method as the treatments frequently must be repeated.

As the passive introduction of lipiodol into the larynx is not dependent upon special instrumentation it is necessary to abolish to some extent the involuntary phase of swallowing. This phase consists of a relaxation of the normal tonicity of the esophageal orifice and an elevation of the larynx toward the base of the tongue together with a contraction of the pharyngeal muscles. This coördinated action is instituted by sensory stimuli applied to the mucous membrane of the pharynx, especially the anterior pillars. When this reflex arc is interrupted the larynx remains in its normal unprotected position and the esophageal orifice is closed. With this situation present, oil readily finds its way into the larynx.

I carry out the passive technic in the following manner: The patient is instructed to present himself with his mouth thoroughly cleaned with an antiseptic mouth wash. The anterior pillars, base of the tongue, and posterior pharyngeal wall are then painted with 10 per cent cocaine until the patient is conscious of a lump in his throat or finds that swallowing requires a conscious effort. Ten to 20 c.c. of lipiodol are then taken into the mouth and held there. The patient steps behind the fluoroscope. He is then asked to throw his head backward, lean to the side into which the lipiodol is desired to gravitate, and finally to grasp his tongue with a cloth held in the opposite hand, pull his tongue to the opposite side and inhale. Under fluoroscopic observation the oil can be seen to flow into the bronchial tree. The patient then expectorates any saliva in the mouth and carries out the same procedure in filling the other lung.

This brief description of the technic requires some amplification. It is important that the patient understand exactly what is expected of him. He is really the one who carries out the procedure and every step must be carried out in an orderly unhurried manner. If the patient does not know the sequence of steps he is very apt to do the wrong thing and produce a failure. For this reason I take great pains to instruct the patient and ask him to go through the procedure at home before coming for treatment. After the first treatment no instruction is needed.

The lipiodol flows more quickly into the lung when it is slightly warm. My custom is to have two beakers, each containing 10 c.c. of lipiodol, placed in a pan of warm water. These are prepared before the anesthesia and are ready for the patient when the anesthetizing is completed.

Fluoroscopic observation is necessary because the passive method is blind, and furthermore the mode of filling is often of diagnostic importance.

A roentgenogram of the chest should be made at the first instillation and it is necessary to have both lateral and anterior plates. There should be no delay taking these, as often only a few minutes is sufficient to render the plates worthless from a diagnostic viewpoint. Arrangements should be made to take the roentgenogram immediately.

Attention should be directed to the manner in which the patient throws the head back. The purpose of this position is to increase the difficulty of swallowing. Often the patient will bend the back instead of the neck. This produces no effect at all. It is better to personally adjust the head while the patient is behind the screen. In leaning to the side many patients simply bend the head. The body must be bent at the hips. The critical point has arrived when the patient pulls the tongue out. Here he often becomes excited and swallows. It is better to prevent this by the admonition, "Don't swallow, breathe in deeply."

CASE REPORT

Case 1.—Mrs. D. S., aged sixty, was referred to me for sinus investigation. She had had severe asthmatic attacks for the past twenty-five years and was greatly worried because the attacks had become more frequent. Various forms of treatment had been without avail. Examination of the sinuses revealed a chronic infection in both maxillary antra. It was decided to instill lipiodol into the bronchial tree before operating upon the antra. On June 12, 1931, lipiodol was instilled into both lungs. Within forty-eight hours there was a complete disappearance of the asthmatic symptoms. A few weeks later antromeatal openings were placed below the inferior turbinates. The day following the operation the patient had several mild asthmatic attacks which were easily controlled by ephedrine. The patient reported November 29th and that she had not been troubled with asthma since the day following the operation.

Case 2.—P. W., a male, aged thirty-two, reported May 23, 1931, complaining of nasal stuffiness, sneezing and watery discharge. These symptoms were associated with typical asthmatic attacks of frequent occurrence.

Various treatments to control the symptoms produced little relief. Skin tests were negative. Nasal examination revealed a marked deflection of the sputum. Nasal membranes were characteristic of the vasomotor type. Sinus investigation with lipiodol revealed a definitely thickened membrane of both antra. Local and general treatment gave little relief. Because he said his asthma caused him the most trouble, lipiodol instillation was advised. This was given June 22nd. June 25th he reported feeling much better. He had no chest symptoms following the instillation and on September 3, antromeatal openings were made. When he last reported on September 29, he had had only one slight asthmatic attack since the lipiodol was instilled. Vasomotor symptoms were negligible.

Case 3.—Mrs. D. J. was first seen November 13, 1929, complaining of asthma, dating back two and one-half years, and a bronchitis of six years' duration. The present attack has been severe for the past four months.

The symptoms consisted of extreme shortness of breath, chronic cough, wheezing and general weakness. General physical examination was negative except for the chest findings typical of chronic bronchitis. Special examination of the nasal sinuses disclosed a chronic purulent maxillary sinusitis. A bilateral intranasal antrum operation was performed November 19, 1929. The purulent discharge continued from the antra until November 30, 1929, when they became clear and remained so. During this time there was some improvement in her asthmatic symptoms in that the attacks were milder. Lipiodol was instilled into both lungs by the passive method December 10, 1929. On January 14, 1930, she reported that she had had no symptoms of bronchitis or asthma, except a slight infrequent cough. Physical examination of the chest was negative except for a few râles posteriorly. At this time the lungs were refilled with lipiodol. This patient died in March following a pelvic operation, but up to the time of her death had had no return of the asthmatic symptoms.

Case 4.—Mr. M. had had asthmatic attacks since October, 1927. With the exception of the lung findings typical of asthmatic bronchitis and the findings of a left purulent maxillary sinusitis, physical examination was essentially negative. The antrum infection cleared up after several lavages but no apparent relief was obtained from the asthma and his physician had to keep in constant touch with him due to the frequency and severity of the attacks. As the usual asthmatic treatment gave only temporary symptomatic relief it was finally decided to use lipiodol. This was instilled into both lungs January 13, 1930. Two days later the patient's extreme cough and extreme shortness of breath disappeared and since that time he has had no asthmatic attacks. His last report showed him to be entirely free from symptoms, and in addition he had gained considerable weight. This patient disappeared and no further reports were obtained.

Case 5.—A. K. had a history of asthma for years when first seen July 12, 1930. He said he was sensiitve to many different things. Nasal examination was negative except for few small polyps in the region of the middle turbinates. Sinus X-rays were clear. Skin tests showed plus 3 and plus 4 reactions to numerous antigens. Lipiodol was instilled August 28th. He says he was much improved until September 8 when he again reported that his symptoms had returned. He was placed upon a diet which eliminated the plus 3 and plus 4 food antigens and was asked to report later.

Case 6.—Mrs. C. came to the office July, 1931, complaining of a chronic cough of several years' duration and asthma for the past seven months. She had been under treatment for nasal trouble, and had been pronounced cured one month previously. Nasal examination disclosed marked polypoid changes in the membranes of both antra. A Caldwell-Luc operation was advised and lipiodol instilled in an effort to get her in better physical condition. Following the instillation she obtained considerable relief from the asthmatic symptoms but little change was noted in the cough. Caldwell-Luc operation performed. Both antra were found to be filled with polyps and greenish pus. Convalescence was rapid and the cough and asthmatic symptoms disappeared before she left the hospital. At the present time her only complaint is that she can not smell. The sense of smell had not been present for over two years. It returned suddenly while she was in the hospital but disappeared again as soon as she went home. It recurs from time to time but only for a few minutes.

Case 7.—Mrs. K., aged thirty-four, had had attacks of bronchitis since childhood. At times during childhood asthma was associated with the bronchitis. For the past six or seven years these attacks have been more severe and frequent and for the past nine months she has been extremely fatigued and unable to walk any distance without suffering extremely from shortness of breath. Asthma attacks had been so frequent her physician had had to keep in constant touch with her. Usual medical treatment had given little result. Lipiodol was instilled October 6, 1929. Filling was only partially successful due to spasmodic contraction of the bronchial musculature. Instillation, however, was repeated until we obtained what we considered sufficient lipiodol in both lungs. From the first instillation, however, the patient felt greatly relieved and now over one year has elapsed since the last one. She has been free from asthma and has gained greatly in weight.

Case 8.—H. C. Male. Aged fifty-five. Complaint: asthma. Physical examination negative except for usual chest findings of asthmatic bronchitis. Usual forms of treatment, including removal of localized chronic infections, afforded him little relief. Lipiodol was instilled in June, 1931. Marked relief was obtained for several weeks and the patient requested another instillation. This was done and the symptoms again disappeared. He has not reported for checking since the last instillation.

Case 9.—A. P., a female, aged forty-five, had suffered from severe asthmatic attacks for seven years. The usual methods of treatment, including removal of foci of infection, gave no relief. Lipiodol was instilled into the lungs December 10, 1929. From this time on, the patient had complete relief from asthmatic symptoms.

Case 10.—This patient, a female aged 40, had had asthma for several years. Symptoms were present nearly all of the day so that she could not do any work about the home. Nasal examination revealed a marked bilateral purulent maxillary sinusitius. Lipiodol was advised as a first procedure with the understanding that an operative procedure on the sinus would follow later. The first instillation resulted in a reduction of the attacks to one a day which lasted about fifteen minutes. The patient felt much better and could walk and get about, something she was unable to do before. Drainage of the antra was then established by antromeatal openings. No further improvement was obtained although lipiodol was again instilled. The Caldwell-Luc operation was advised, but the patient refused further operative interference.

Case 11.—Mrs. E. K. was first seen August 4, 1931, with a history of asthmatic attacks for the past four years. She had tried many forms of treatment and undergone several operations, including the Caldwell-Luc and ethmoid exenteration, but no relief was obtained. Skin tests were negative. Nasal examination revealed a chronic catarrhal condition of the membranes but no evidence of abnormal discharge from any of the sinuses. In view of the fact that other treatment had failed it was suggested that lipiodol be instilled into the bronchial tree. This was done on September 3, 1931. The patient reported on September 3 that she had derived little benefit from the treatment. On November 29 she reported with much elation that her asthma was "cured." Following the previous visit her symptoms had gradually disappeared and for some weeks she had been symptomless. She ascribed all her relief to the lipiodol.

Case 12.—This patient, A. H., was treated by me at the Jackson Bronchoscopic Clinic in Philadelphia at the request of Dr. Harold F. Robertson. The patient gave a history of severe asthmatic attacks for the past five years. These attacks had gradually been increasing in severity. Four years ago he was treated in Temple University Hospital with some relief. However, the symptoms gradually increased and the attacks became more frequent. Four weeks previous he had had severe attacks and was admitted to the hospital. Ethmoidectomy was performed at this time and great relief was obtained but he was still short of breath. He was discharged from the hospital on January 20, 1932. On January 28, the attacks returned with increased severity. Adrenalin gave relief for one hour. Severe attacks continued until February 2, 1932, when lipiodol was instilled into both lungs. The patient's symptoms disappeared the same day and up to ten days after the instillation he had been symptom-free.

Case 13.—A female, aged twenty-six, came to me November 27, 1931, giving a history of asthmatic attacks since she was a small child. She had had no attacks from 1918 to 1927. In the fall of 1927, symptoms returned but disappeared again during the winter. She had no trouble until early in 1930 when she began to wheeze and cough again. Symptoms were quite marked until March, 1931, when the symptoms abated greatly. Five weeks previous, the cough had returned, associated with shortness of breath and wheezing, slightest exertion bringing on an attack.

As she had recently been examined by her own physician no general examination was undertaken. Chest X-rays were negative. Nose and throat examination disclosed markedly thickened membranes in the maxillary sinuses. Tonsils had been removed one year previously, and both fossæ were clean. As the patient had been referred for lipiodol instillation only, this was the only procedure carried out. On December 8, 1931, 10 c.c. of lipiodol were placed into each lung. The patient reported again December 14, 1931, feeling fine. By May 5, 1932, she had had one slight attack which had lasted a few hours, and was brought on by drinking malt. The patient has a history of sensitivity to malt.

A FOLLOW-UP STUDY OF VARICOSE VEIN INJECTIONS*

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This follow-up study of the results of varicose vein injections was primarily induced by an unfortunate fatality which occurred as the result of vein injections in a man who had extensive varicose veins and a large varicose ulcer. Before and since this accident it had seemed to us that we were seeing an increasing number of varicose vein recurrences.

In reviewing the recent literature upon the results of varicose vein injections one finds considerable variance in the reported results. Kern,[1] in reporting 100 cases treated by solutions of dextrose and sodium chloride (the oldest case being followed for a period of eighteen months), reports recurrences in 10 per cent. De Takats[2] reports a 10 per cent recurrence within the first year. Howard, Jackson and Mahon,[3] in reporting a series of sixty-six cases, where the sclerosing agent used was 20 per cent sodium chloride, and where these patients were followed for one year, report a recurrence in fifty-two cases. De Takats[2] emphasizes the importance of proper diagnosis and indications for treatment, as well as the type of treatment, the technic and the use of the proper sclerosing solution. McPheeters, Merkert and Lundblad,[4] in discussing the causes of failure in the injection treatment of varicose veins, emphasize better technic and multiple injections. They state that recurrences are due to too great dilutions, failure to thrombose the great saphenous, and occurrence of normal recanalization. In order to prevent recurrences, they recommend injecting the great saphenous trunk, emptying the veins before injection, localizing the sclerosing solution, choosing the proper sclerosing agent, and keeping the patient under observation until all the varicose veins are sclerosed.

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*From the Duluth Clinic.

In January, 1930, we reported[5] the use of sodium chloride in the treatment of varicose veins in eighty-one cases, and this present study covers the follow-up of these cases, together with others which have been under treatment since that time. The sclerosing agents used have been 20 per cent sodium chloride, 70 per cent glucose, or a combination of the two.

The data which will be submitted were accumulated as the result of a questionnaire sent out to some 300 individuals who had been under treatment and observation since 1928, when the treatment by varicose vein injections was begun in this clinic. To this questionnaire 155 answers were received, and the results of this questionnaire, together with the case report of the fatality, will constitute the body of this paper.

There are some who probably would question the accuracy of a questionnaire. It should be fairly satisfactory, however, because it gives the patient's point of view. The majority of this group of patients were under our close and repeated observation from 1928 on, and we personally feel that the results of this questionnaire are an accurate barometer of the results to be expected from varicose vein injections.

Five simple questions were asked, namely: (1) Do you still have trouble with your legs? (2) Are you now taking treatments for varicose veins? (3) Have you consulted other doctors to continue treatments? (4) Have you noticed that any of the varicose veins came back? (5) Have you been satisfied with the results of these treatments?

To this questionnaire, as stated before, we received 155 replies. In this group sixteen did not complete their treatments. It should be stated here that the treatments were not confined merely to vein injections, as thirty-eight cases were complicated by varicose ulcers. The various types of treatment included moist packs, adhesive strapping, compression bandages, Unna casts, and ligation of the saphenous trunk in five cases.

Seventy-two, or a little less than 50 per cent of the patients, reported that they still had trouble with their legs. Only approximately 10 per cent were still under treatment. Less than 10 per cent consulted other doctors to continue treatment. Sixty-one patients, or approximately 30 per cent, stated that they had noticed recurrences. Eighty per cent of the cases were satisfied with the results of treatment.

The following is the case report of the one fatality:

Mr. C. A. P., a male, aged forty, first came under our observation on August 2, 1928, and at that time he was complaining of varicose veins and a varicose ulcer.

Examination revealed extensive varicose veins of both lower extremities, with a large varicose ulcer on the right leg just above the ankle and on the inner side of the leg.

Vein injections were begun, and these were continued at intervals up until October 6, 1928, when it was reported the ulcer was healed and the veins were thrombosed.

This patient was not seen again until September, 1931, when he returned because of a recurrence of the veins and of the ulcer of the right leg. Again vein injections were started and continued at intervals until following an injection on October 17, 1931, he developed a severe phlebitis in the right leg, which extended up into the thigh and was accompanied by fever and chills. He was hospitalized on October 24, and at this time he was very evidently septic.

Death occurred on October 27 and autopsy revealed varices and ulceration of the skin of the right leg, edema of the leg, multiple abscesses of both kidneys, bilateral fibrinous pleurisy, beginning bronchopneumonia, acute congestion of the spleen and coronary sclerosis (Grade II). Smears from the right leg and from the abscesses of the kidneys revealed staphylococci.

SUMMARY

1. The results of a follow-up study upon 155 cases of varicose veins treated by vein injections are reported. Approximately 50 per cent of these cases still have complaints referable to their legs, 30 per cent report recurrences and 80 per cent have been satisfied with the results of treatment.

2. A case report of one fatality in the group is submitted.

CONCLUSIONS

Our experiences gained in the treatment of these 300 cases of varicose veins and varicose ulcers lead us to the following conclusions:

1. A careful appraisal and selection of the individual for varicose vein injections should be made.
2. A careful technic and selection of the proper sclerosing agent to suit the particular case must be instituted.
3. In suitable cases ligation of the great saphenous trunk, followed later by injections, will give more certain results.
4. Finally, a sane enthusiasm should be maintained toward the cure of varicose veins by injections.

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CARCINOMA OF THE FEMALE BREAST*

EARLY DIAGNOSIS AND OTHER FACTORS AFFECTING PROGNOSIS

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CANCER, one of the greatest scourges of our civilization, attacks both sexes, but with greater frequency in different organs. In the female, the most common site for cancer is in the uterus; next in frequency is the breast; these two sites accounting for 40 to 50 per cent of all primary cancers in women.[1]

History.—Although cancer has affected the human race for centuries, it was not until after the introduction of anesthetics during the last century that surgeons began to operate more frequently and keep more detailed records. The pathology and dissemination of cancer were not understood and circumscribed operations were undertaken. Very few patients recovered. One famous surgeon of those days (Haynes Agnew) is quoted by Halstead,[2] as saying that he operated on the breast solely for the moral effect on the patients. It was commonly believed in the 1860's and 70's that operation hastened the end, and the general practitioner of those days hesitated to refer these cases to the surgeon. Unfortunately we have these anachronisms with us today.

Billroth[2] improved the mortality rate by rapid and careful surgery and claimed a cure if the patient lived and showed no local recurrence in the scar in one year. Eighty-two per cent showed recurrences. Valkmann,[2] in 1875, stated that "one may feel sure of the result," if no local recurrences were found in three years. He removed the fascia from the pectoral muscles, and the fat and glands from the axilla. He reported 14 per cent of cures.

The credit for the radical operation for removal of the breast with the marked increase in permanent cures is usually ascribed to two American Surgeons of the early '90's, Willy Meyer of New York and William S. Halstead of Johns Hopkins, Baltimore, who independently described the radical removal of the breast for cancer. Halstead reported a series of fifty cases in 1894 and introduced the following radical changes in the operation.

1. Removal, always, of the pectoralis major

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*Based on a study of sixty-six cases at the New Asbury Hospital, Minneapolis, by Dr. McKenzie, intern. Awarded second prize in the Annual Essay Competition of the Minneapolis Surgical Society, 1932.

muscle, leaving the clavicular portion intact, and the removal of half, sometimes all, of the pectoralis minor muscle.

2. Removal of all tissues intact.
3. Bloodless operation.[2]

The next important step in the cure of carcinoma of the breast was by W. Sampson Handley,[3] who, in 1904, explained, in effect, the rationale of the radical operation and proposed a wide dissection of the deep fascia. By careful microscopic studies he found that cancer cells grow along the lymphatics found in the deep fascia of the breast and the underlying muscles. This method of spread he designated "lymphatic permeation" and found that it took place against the lymph stream equally as well as with it, thus explaining the radial spread of cancer. He also found that the cancer cells produced an inflammatory reaction about the lymphatics, tending to destroy these cells, which process he termed "perilymphatic fibrosis." Cancer thus spreads in the parietal tissues by permeating the lymphatic system "like an invisible annular ringworm. The growing edge extends like a ripple in a wider and wider circle, within whose circumference healing processes take place so that the area of permeation at any one time is not a disc, but a ring.[3]" "We cannot predict which one or more of the lymphatic routes to skin and fat, to bones, or to thoracic and abdominal viscera, permeation will elect to follow in any given breast case, but once we obtain evidence of permeation having started on one or more routes, we can make a reasonably accurate prediction of the metastatic deposits that will follow."[4] The recognition that cancer, if disturbed, may grow more rapidly, made some method of immediate diagnosis at biopsy necessary. This has been provided by staining of frozen sections, immediate diagnosis, and continuation of the operation without lapse of time.

The discovery of roentgen rays and radium led eventually to another important advance in the treatment of cancer of the breast. It was found that these rays killed immature cells of the tumor more easily and more quickly than mature cells of the tissues. This fact has led to the use of X-ray and radium in the preoperative and postoperative therapy of breast cancer.

During the past twenty to twenty-five years there have been no startling advances in the cure of cancer, but technic has been improved and a mass of valuable data assembled.

Basis of Study.—This study of carcinoma of the breast is based on a series of sixty-six cases of women with this disease, admitted to New Asbury Hospital, Minneapolis, during the years 1924-1931, inclusive. Of these cases, forty-nine were admitted previous to March 15, 1929.

The study is based on the intern's histories, the surgeon's dictated operative report, the pathologist's report, and a follow-up of the patients by personal interviews with the surgeons. Most of the patients have returned twice a year to their respective surgeons for a periodic check-up.

Age.—Cancer of the breast is essentially a disease of middle life. No case occurred in this series before the age of twenty-five. The age limits were 28 to 91 years. The average age was 53.3 years.

TABLE I

Age Series

Age	No. of Cases
25-34	3
35-44	7
45-54	19
55-64	15
65-74	11
Over 75	7
Age not given	4
Total	66

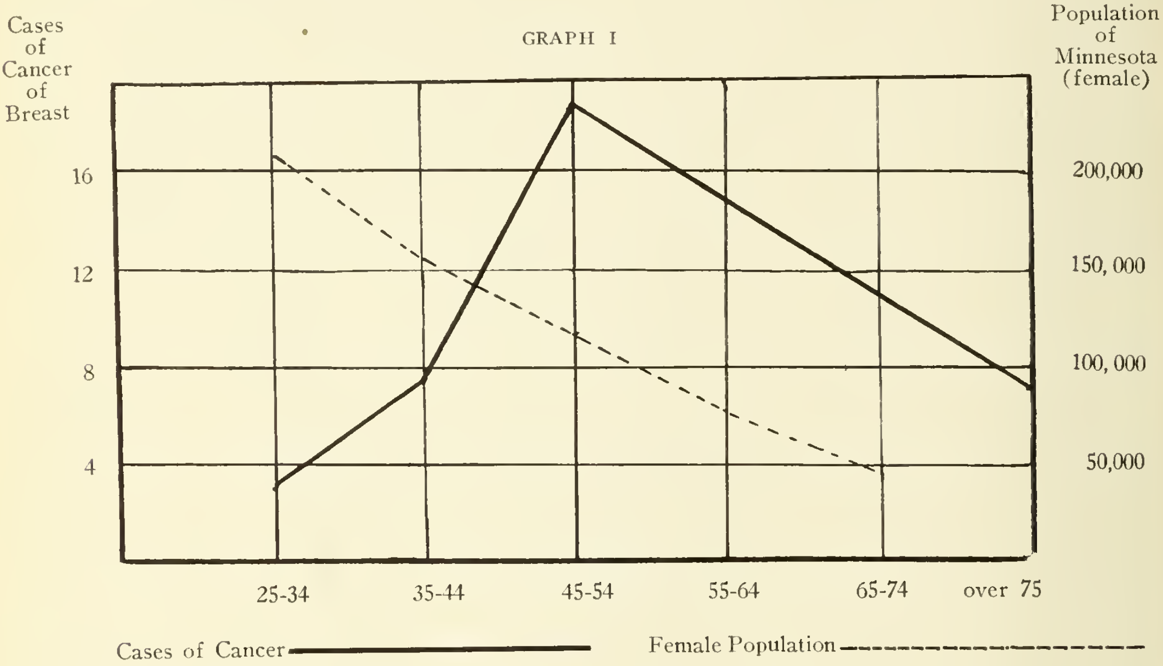
Thus, over 50 per cent of cases occurred between the ages of 45 and 65 and nearly 30 per cent in the decade after 45 years. The relative frequency is greater in these decades. The accompanying graph shows the female population in Minnesota according to the U. S. census[5] in the above age periods, with a graph of the above incidence of cancer superimposed upon it.

This graph shows that cancer increases relatively very sharply in the fourth and fifth decades, but declines correspondingly with the total female population in the later decades. Carcinoma is then selective for the age group 45 to 54.

Married and Single.—For many years cancer of the breast was thought to be a disease of married multiparæ but more recent figures show that this is not so evident as was formerly supposed. Dean Lewis[7] states, in reporting 950 cases at the Johns Hopkins Hospital, that "marital status played no part in the occurrence of cancer of the breast in this (Johns Hopkins Hospital) series of patients."

In our series of 66 cases there were fifty-seven married and nine single women. Of the fifty-seven married women the pregnancy record of forty-two only is noted. Of these there were nine nulliparæ, so that only 33 had borne children. But the proportion of single to married in Minnesota over 25 years of age is 1 to 3.[5] A corrected comparative figure then would be 27 single, 9 married nulliparæ and 33 multiparæ. The marital status probably plays little part iin the production of cancer in America.

GRAPH I



Right or Left Breast.—In this series of sixty-six cases, the primary tumor appeared thirty-five times in the right breast and thirty-one times in the left breast. No record is given as to the dextrality or sinistrality in these cases and therefore no conclusions can be drawn.

The affected quadrant of the breast was stated in very few cases.

Types of Carcinoma.—The cancer tissue removed at operation was examined microscopically by the staff pathologist. In doubtful cases he submitted sections to pathologists at the University of Minnesota or the Mayo Clinic at Rochester for consultation. All suspicious axillary glands were examined.

TABLE II

Types of Cancer of Breast

	No.	Per cent
Scirrhus	49	74.3
Medullary	5	7.6
Adenocarcinoma	4	6
Not given	8	12
Total	66	

The cancers were assigned to three classes. For various reasons no examination was made or no record given in eight cases.

Types of Operation.—All the primary operations except three were of the Halstead, Jackson, Rodman types or some modification. In one case the fascia only was removed, leaving the pectoral muscles in place. In two cases the tumor only was removed. Unfortunately there is no follow-up of these two cases.

It is very difficult to evaluate the type of operation in this small series. Dean Lewis[7] makes considerable mention, however, of types of operation in the Johns Hopkins Hospital series of 950 cases. He concludes that: (1) meticulous care in dissection and wide incision are important; (2) "for patients . . . in whom there were regional metastases the percentage of deaths is lower for the Halstead Thiersch graft than the closed plastic group and the same may be said for the series without metastases except for the 5 to 9 year period.

Operative Mortality.—One patient in the series died eleven days post-operative, of bronchopneumonia, an immediate post-operative mortality of 1.5 per cent.

Study of Forty Cases.—Some of these sixty-six patients had been operated upon too recently for conclusions to be drawn regarding the results of operation. Seventeen patients had been admitted since March 15, 1929, leaving a total of forty-nine admitted from 1924 to March 15, 1929. Of the forty-nine, no follow-up could be obtained in nine cases, leaving forty patients on whom sufficient data were available to attempt drawing conclusions.

The following table shows how these are grouped.

TABLE III

	No.	Per cent
Alive and well after 5 years	6	15
Alive and well after 3 years	15	37.5
Alive but with recurrences regional or local after 3 years	5	12.5
Dead within three years from recurrence	8	20
Inoperable cases	3	7.5
Dead within 3 years from other causes; no recurrences noted	3	7.5
	40	

There were then 65 per cent alive at the end of three years; 52.5 per cent without recurrences, and 12.5 per cent with recurrences.

Early Diagnosis.—The classical diagnosis of cancer of the breast has been fixation of tumor, retraction of nipple, ulceration, bleeding from the nipple, axillary involvements, and cachexia. This is comparable to the classical signs of intestinal obstruction—fecal vomiting, constipation, distended abdomen and Hippocratic facies—and the diagnosis made on these signs results in about the same chances for recovery.

There are various reasons why women with lumps in the breasts neglect to seek diagnosis early. Cancer of the internal organs may attain a large size before it is recognized. With the breasts not inaccessible it is strange that changes in their contour and consistency are not sooner noticed. However, patients more commonly seek medical service on account of pain, and pain is absent in most cases of breast cancer. It was a primary symptom in only 11 per cent of this series.

Some women, even after discovering a lump, are "afraid it is a cancer" and do not seek diagnosis. In some cases the lump is attributed to injury (10 per cent in this series), but it is doubtful if trauma plays any part in the production of the disease. Every woman can recall some blow or injury to the breast, but very few develop carcinoma. The rise of so many non-surgical cults undoubtedly has its effect, two in this series having sought non-surgical relief.

The remissness in diagnosis is not entirely due to laxity on the part of the patient. Although somewhat incredible, five women in this series (7.5 per cent) had seen their doctor and apparently had been advised that the lump was not a cancer or had been advised against operation.

In most cases, a lump is the earliest sign. In this series it was noted as a first symptom in 80 per cent, and was present, of course, in 100 per cent. Pain was a first symptom in 11 per cent, discharge in 3 per cent, tenderness in 1.5 per cent (one case). Drs. Pfahler and Widman of Philadelphia[8] in a series of 801 cases, however, give lump as the first symptom in 53 per cent and pain in 21 per cent.

Sir George Lenthal Cheatle[9] gives the following points in early diagnosis. He considers any woman in the cancerous age as susceptible (and the cancerous age as shown by other statistics is any age over seventeen years).

1. If the breast contains a painless lump, completely round, small and not adherent, it in all probability is a carcinoma.
2. If the painless lump is lobulated, lightly attached to the skin, but elastic and fluctuating, it may be a fibro-adenoma, but, in any case, a biopsy should be performed with a generous removal of the surrounding area, and its nature determined macroscopically and microscopically.
3. If there is a spontaneous discharge of blood from the nipple, increased by pressure, in a breast containing any sized tumor and no very recent history of trauma, the breast is considered cancerous.
4. If there is a persistent spontaneous discharge of serum from the nipple in a breast containing a lump, the breast is considered cancerous.
5. If there is a localized "lumpiness" in any segment, a biopsy should be done, but if there is any suspicion of puckering or increase in size, the breast is considered cancerous even before biopsy.
6. If there are generalized fluctuating lumps he considers the breast cancerous, but admits that there is room for argument in these cases.

He advises immediate radical removal of all cancerous breasts. With regard to the last diagnostic point Dr. Bloodgood[10] states, however, that "border line breast tumors in the clinical group are those in which, no matter what the signs and symptoms may be, one is still uncertain as to definite malignancy. In this group exploration should be done."

There are a few elementary points in the clinical examination that will always bear repetition as they assist in early diagnosis. Sir G. Lenthal Cheatle prefers the patient on the back with a pillow properly placed under the shoulder blades in order to make the breasts more prominent and the axilla more easily palpated. Others prefer to have the patient sitting up squarely in bed or on a chair.

On inspection one looks for a lump, puckering of skin, retraction of nipple, elevation of breast, changes in the texture of the skin, and supraclavicular fullness. On palpation, one uses the flat of the hand to discover the position and consistency of any lump, the thumb and forefinger to test for adherence to skin or underlying fascia and the tips of the fingers to palpate nodes in the breast and axilla.[11]

Recently two other methods of early diagnosis have been described. Dr. Max Cutler reports favorably on transillumination of the breast as a means of early diagnosis.[12] Drs. Fray and Warren have very recently described a method of diagnosis by means of stereoscopic roentgenography of the breasts and offer the method as a valuable supplement to clinical examination in establishing diagnosis and assisting in prognosis. They conclude that most of the gross pathological changes in the breast are as readily identified in stereoscopic roentgenograms as they are in gross specimens at biopsy or autopsy.[13]

Undoubtedly the responsibility of early diagnosis primarily rests upon the women who may have tumors in the breasts. In many cases those tumors grow slowly and are not observed. Many things, although quite noticeable, escape observation, until one's attention is drawn to them and this commonplace may explain why so many women do not notice a tumor in its operable stages.

Consequently there is a certain responsibility devolving on the medical profession of drawing the attention of women everywhere to the occurrence of tumors in the breast. Probably this may best be done by talks over the radio and by articles in the newspapers and in popular health magazines. Nor should we cease to advocate periodic health examinations.

OTHER FACTORS AFFECTING PROGNOSIS

1. *Age of Patient.*—In this series of forty cases, the following table gives the ages according to groups.

TABLE IV

	Age limits	Av. age
Alive and well after 5 years	28-62	50
Alive and well after 3 years	34-72	58
Alive after 3 years with recurrences	43-75	61
Dead before 3 years	46-82	63

This would seem to indicate that the younger the patient the better chance for operation recovery and longer life. However this series is too small, and the expectancy of life at given ages has not been calculated, so that no conclusions can be drawn. It is noteworthy though that the two youngest patients in the series, twenty-eight to thirty-four years, are still alive and well three and five years respectively after operation.

Drs. Burton J. Lee and N. W. Cornell in a series of eighty-seven cases conclude, on the other hand, that cases occurring under forty years of age have a more unfavorable prognosis than those occurring in patients over sixty years.[14]

Dean Lewis also notes, in 116 cases, that on the whole the younger the patient, the more susceptible to local recurrence.[7]

2. *Duration of Lumps.*—The preoperative duration of symptoms was noted with reasonable certainty, in only twenty-four cases.

Of twenty-one patients still alive three and five years after operation, the duration of symptoms ranged from one week to ten years, with an average of twenty months. Only one patient had symptoms for more than four years and it is noteworthy that although she had had a tumor for ten years, she had taken X-ray treatments three years previous to operation.

Of those dead of recurrences within three years the average preoperative duration of symptoms was four and a half years.

In Dr. Halstead's original series reported in 1894 the preoperative duration of symptoms of those alive after three years was only five months.[2]

Quoting Dean Lewis' report of 950 cases:

(a) "There is a marked difference in those coming early to operation, within three months, and those not coming for 12 to 24 months. Of the former group there was a great mortality for three years but those alive then survived many years. This is due to the type of tumor and rapidity of growth causing widespread early metastases. Of the latter group, more died after three years, pointing to a relatively slow growth of tumor."

(b) "Over one-half of those still living were operated upon within six months of onset."

It may be safely concluded then that early diagnosis and operation, within a few weeks of onset, give the greatest chances for permanent recovery.

3. *Type of Tumor.*—Previous to operation the type of tumor is not usually known, although it may be presumed. For purposes of prognosis after operation, however, the type of tumor may be taken into account.

In this series 74 per cent were scirrhous carcinomas. In the patients surviving more than three years there were twenty cases or 95 per cent of the scirrhous type and only one of the medullary type.

4. *Metastases of Axilla.*—In attempting to establish a relationship between axillary involvement and prognosis, the reports of the surgeon and pathologist only were taken, as they had access to the area involved. The series taken consists of those alive at the end of three years with or without metastases and those dead before three years of recurrences. There were thirty-four cases. In four cases it was not definitely stated that the axillary nodes were not involved. In the remaining thirty cases the axillary nodes were involved in twenty. Of these twenty patients, ten had metastases or were dead of metastases within three years. Of twenty-one patients alive and well after three years, ten had involvement at operation, ten were free and one was not noted.

TABLE V

Axillary Metastases

	Alive and well	Dead or with met.
Nodes involved in axilla	10	10
Nodes not involved	10	....
Not given	1	3

An attempt was also made to correlate adherence to skin and fascia or both but data were insufficient. The following, however, is noted concerning the axillary involvement combined with adherence to skin and fascia.

From this series then one might conclude that even with axillary metastases 50 per cent of patients are alive and free from recurrence in three years but that with axillary involvement combined with adherence of the tumor to skin or fascia, the chances of living three years are decreased at least one-half.

Dr. Burton J. Lee[14] found, however, that only one patient of seventy-five with axillary nodes involved lived five years.

TABLE VI

Adherence and Metastases

	No. of cases	Adherent, axilla involved	Per cent
Alive and well after 5 years	6	0	0
Alive and well after 3 years	15	6	40
Dead with metastases in 3 years	8	6	75

5. *Deep X-ray Therapy or Radium Postoperatively.*—The data concerning deep X-ray therapy and radium used postoperatively was inconclusive as the treatments given in all cases could not be ascertained. However, forty (52.5 per cent) of the series received some form of postoperative radiation. Of those surviving five years, 83 per cent received some form of postoperative radiation, whereas of those dying within three years only 50 per cent received any form of postoperative radiation. This seems to point to some value in postoperative radiation therapy.

6. *Pregnancy and Lactation.*—There were no pregnant women nor any with lactating breasts in this series. It is quite generally noted that prognosis is extremely unfavorable in these cases.

SUMMARY

A study of 66 cases of carcinoma of the breast in women, admitted to New Asbury Hospital, Minneapolis, from 1924 to 1931 inclusive, is presented. More detailed study is given of forty-nine cases admitted prior to March 15, 1929, on 40 of which a follow-up was obtained. Quotations and adaptations from recent literature on the subject of breast cancer are also given. Some diagnostic points in early carcinoma are noted. The responsibility for early diagnosis is placed chiefly on the patient but also to some extent on the medical profession. Other factors, affecting prognosis, such as age, duration of symptoms, axillary involvement, and postoperative radiation, etc., are reviewed.

CONCLUSIONS

1. The chances of patients for permanent cure today are greatly increased over those of the last century.

2. Carcinoma of the breast is selective for

the age group of forty-five to fifty-four years.

3. Over 50 per cent of patients in this series of forty cases were alive and without recurrence three years after operation.

4. Axillary metastases combined with adherence of the tumor to skin and fascia markedly diminish the chances of cure.

5. Post-operative deep X-ray therapy and
rences.

6. Early diagnosis and early operation still
radium may be of value in preventing recur-
offer the greatest hope of permanent cure.

Note: The writer wishes to thank the Superintendent and the Surgical Staff of New Asbury Hospital, for making records available, and for their kind cooperation in the follow-up of patients.

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THE CONTINUOUS SIPHONAGE TREATMENT BY NASAL CATHETER FOR POSTOPERATIVE VOMITING, PAIN AND DEHYDRATION*

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BASSLER,[1] in 1919, published an article on siphon drainage by means of the duodenal tube, and reported a case of postoperative ileus successfully treated. He also reported a case of acute dilatation of the stomach so treated and adopted a method for continuous drainage of the stomach by passing the tube through the nostril into the stomach.

A. L. Levin[2] devised a new tube with a small catheter tip which could be easily passed through the nose. This he found was better tolerated in continuous siphonage of the stomach and duodenum.

Human beings have inherited from their prehistoric ancestors the dread of pain. It has always been interpreted as a sign of danger to the individual. If it were not for the knowledge that pain and other unpleasant sensations such as vomiting, thirst, ileus, obstruction, or peritonitis occasionally follow operations, patients would more readily consent to necessary surgical procedures. The profession has constantly tried to mitigate the suffering following abdominal operations, and has made some progress as shown by the relief afforded today compared with that of earlier years. The prospective surgical patient today is thoroughly examined and the vital organs are put in the best possible condition before operation. An anesthetic that is most suitable is selected. Postoperative pain, vomiting, thirst, and toxemia are combated by more effectual means.

Acute dilatation of the stomach and gas in the intestines are accompanied by pain and general discomfort, but when these conditions are absent the comfort and convalescence of the patient is more satisfactory.

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*Read before the Minnesota Academy of Medicine, February 10, 1932.

Frequent gastric lavage following laparotomies has aided materially in effecting a smoother postoperative course. The surgeon who habitually employs this means of decompressing the abdomen is doing much to aid in the recovery of his patient and in lessening the mortality rate. Although frequent gastric lavages are beneficial, the patient often suffers again shortly following the washing. Consequently, some have used the continuous suction apparatus to prevent recurrence of these symptoms as, by this method, the gas and deleterious substances can be continuously removed from the stomach.

The benefits to be obtained by such a procedure are not generally known. It is my purpose in this paper to draw the profession's attention to this humane procedure, and to urge its more general adoption.

The Levin tube is passed through the nose into the stomach and the catheter attached to a tube connected with a bottle as shown in the illustration (Fig. 1). Gases and toxic substances are at once extracted from the stomach and the patient soon begins to show the effects of the treatment.

This method of avoiding gas accumulation and vomiting I first attempted in 1924, in a patient with a perforated duodenal ulcer that could not be securely closed at the time of the operation. The catheter introduced through the nose into the stomach prevented "a blow-out" and relieved the gas pressure. It was a simple method of siphonage whereby the gases and liquids could escape. There was no attempt, however, to measure the amount of gas removed or fluids assimilated.

Burt[3] published an article in 1931 in which he described the use of the Levin tube passed through the nose into the stomach. He withdrew the gas and fluid contents from the stomach with a syringe. He allowed the patient to drink fluids or injected them into the stomach through the tube with a syringe. He did not, however, calculate the amount of gas removed.

The method described by Wangensteen[4] before the last Western Surgical Association in December, 1931, provides a more perfect means of measuring the amount of gas extracted, the fluid intake, and the amount assimilated. I have employed with marked success a similar method of late in my severe postoperative cases.

Some of the advantages of the continuous siphonage in postoperative or obstructive cases by means of the nasal catheter are hereinafter discussed. A non-inflammatory surgical patient does not have much pain following an operation unless the operation is connected with some part of the body that cannot be immobilized or in which pressure cannot be prevented either from gas or contiguous moving organs. An operation performed upon any of the abdominal organs is usually followed by irritation and pressure within the intestines from the accumulation of gas and intestinal contents. If gaseous distention of the stomach and the intestines can be relieved, there will be less pain and less need for narcotics. Any means of eliminating the use of narcotics is of great value. Continuous suction meets this indication.

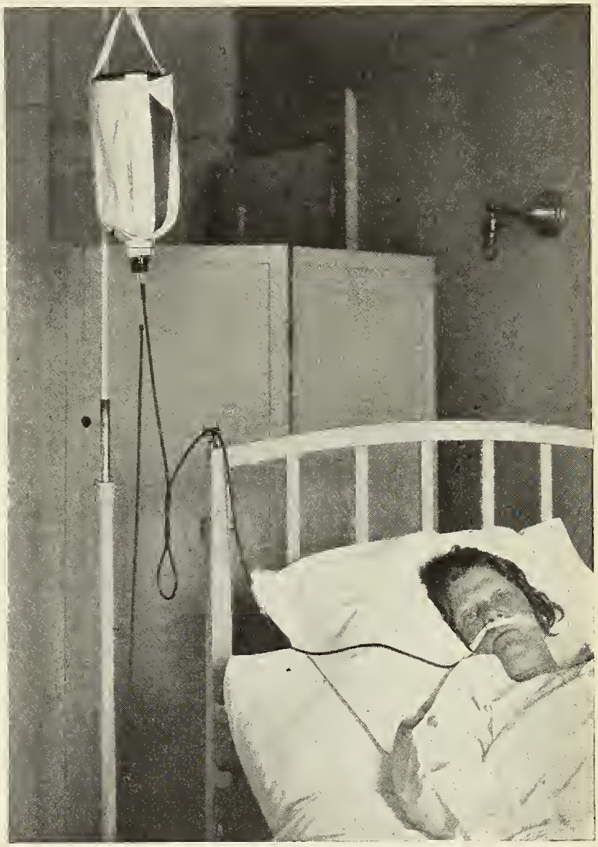


Fig. 1

One of the most distressing sequelæ following operation is nausea and vomiting. The patient can take no food, suffers pain while vomiting and is fearful of breaking open of the wound. The continuous catheter suction does prevent vomiting as it empties the stomach and permits the patient to drink freely of water and other liquids.

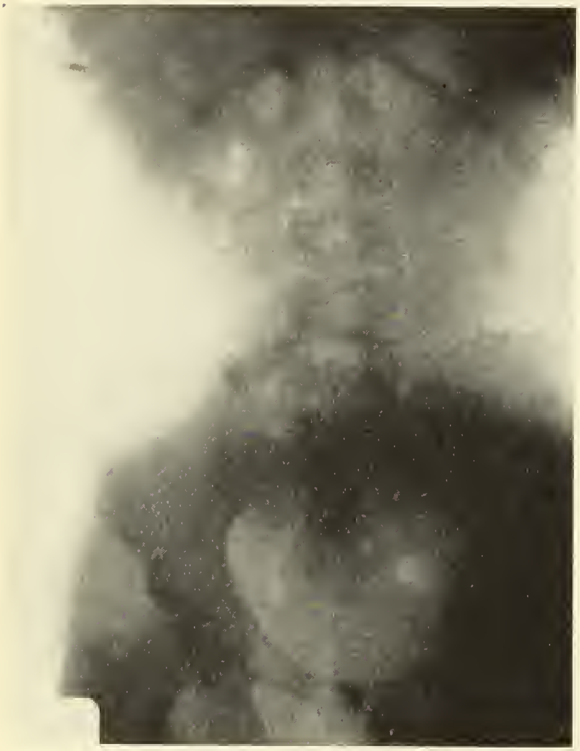


Fig. 2.

It is very important following an operation to supply fluids to the tissues and this is accomplished by proctoclysis and hypodermoclysis. These, however, can be discontinued in a short time after the installation of the suction apparatus because the patient can then begin to drink water and other fluids with less distress, pain, or vomiting, unless there is complete obstruction of the gastro-intestinal tract. The suction apparatus can be shut off at intervals so that gradually more and more of the fluids are allowed to pass into the lower intestinal tract and be absorbed.

The retention catheter allows the taking of large amounts of cold water, which is gratifying to the patient, cools the tissues and reduces the local as well as the general temperature of the body.

Marked reduction in the pulse rate is noticed when the gas pressure is removed, and fewer or no stimulants are required.

The early restoration of the activities of the liver, gallbladder, stomach, and bowels seems to be brought about. The gas and deleterious regurgitated substances are extracted from the stomach at once. The sight, taste, ingestion, and actual presence of food in the stomach stimulates the glandular activity, and the alimentary canal is then prepared to receive the food. Digestion and assimilation begin and the presence of the normal constituents in the bowel produces peristaltic activity with elimination of waste products.

Toxicity in obstructive cases or diffuse peritonitis is a serious complication following laparotomies. The installation of continuous suction lessens the intra-abdominal tension, removes the gas and regurgitated toxic material, favors the return of normal peristalsis and minimizes the possibility of postoperative adhesions. The heart is less embarrassed and the strength of the patient improves.

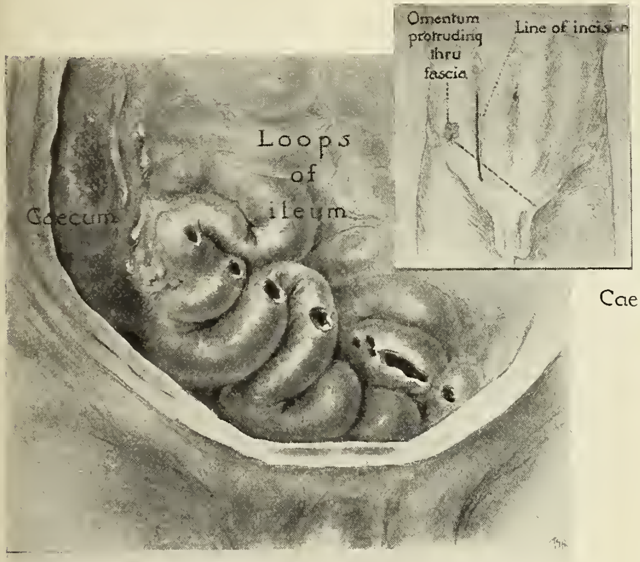
Restlessness and loss of sleep interferes with convalescence and is as necessary to combat as real pain. If we can overcome fear, strengthen the morale, and restore confidence by promoting comfort, rest, and sleep, convalescence is smoother and recovery is hastened. Satisfying thirst and hunger with water and liquid food without disturbing the tranquility of the stomach, as is possible with the suction method, has a favorable psychological effect on the patient.

When the continuous suction is started early after operation before the stomach becomes distended with gas, and in advance of any severe embarrassment of the heart from pressure, suffering is minimized, convalescence shortened and the mortality rate reduced.

The introduction of the catheter is simple. A small amount of cocaine is sprayed into the nostril. A good rubber catheter, well lubricated, is passed into the nares and the patient is instructed to swallow. The physician then gently but rapidly feeds the catheter until it enters the esophagus and then the stomach. The patient may further assist by drinking water at the same time.

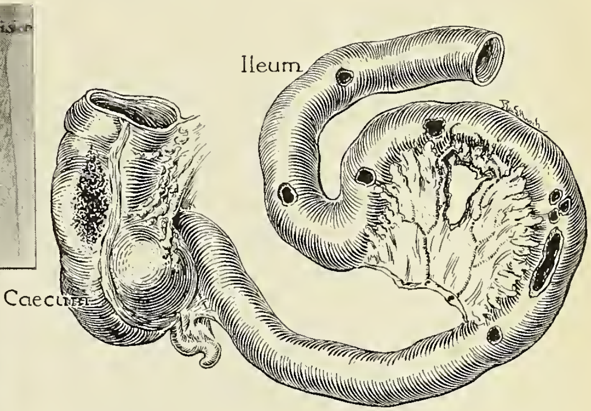
The catheter can usually be kept in the same nostril continuously without discomfort if the mucous membrane is sprayed daily with ephedrine and a mild saline antiseptic, and a liquid non-irritating lubricant is occasionally introduced into the nose.

After the introduction of the tube the patient may then begin to drink water freely and later orange and grape juice, ginger ale, broth, beef tea, etc. All liquid food, however, must be strained through gauze to remove any particles that might block the catheter and prevent proper suction.



Pathway of bullet with injuries to intestine

Fig. 3.



Relative location of intestinal injuries

Fig. 4.

It is important that a well trained nurse be in charge. She must understand the modus operandi of the apparatus, its object, and how to overcome any blocking of the tube and how to detect leaks. The success of the procedure depends upon her watchful care.

In order to measure the amount of gas siphoned and the fluids assimilated, one must have a known amount of air and water in the suspended bottle and the tube in the floor bottle submerged beneath a known amount of water. The known loss of fluid in the suspended bottle subtracted from the amount siphoned into the bottle on the floor will give the amount extracted from the stomach. This subtracted from the amount of fluid taken by mouth determines the amount retained. These figures added for twenty-four hours will give the daily amount of fluid absorbed. The amount of gas removed is determined by measuring the amount of gas in the suspended bottle, subtracting therefrom the known air in the top of the suspended bottle at each filling of the bottle with water and adding these figures for the daily output.

I have found that 4,000 c.c. graduated bottles are very suitable and placing 3,000 c.c. of water in the inverted, suspended bottle and 300 c.c. in the floor bottle makes it much easier for the nurses to make twenty-four hour calculations of gas, amount of fluids taken, amount siphoned from the stomach, and the amount assimilated.

It is essential that the apparatus be carefully watched to determine whether there is perfect suction or not, and to see that no particles of food remnants or mucus clog the small openings and lumen of the tube. If the tube does clog it may be clamped above the glass connection which unites the catheter that is in the stomach with the longer tube which extends through the cork of the elevated, inverted bottle. This tube should extend above the level of the fluid in the suspended bottle. The catheter can then be cleaned out by injecting water through it into the stomach and withdrawing it again.

The following cases will illustrate the use and advantages of the method.

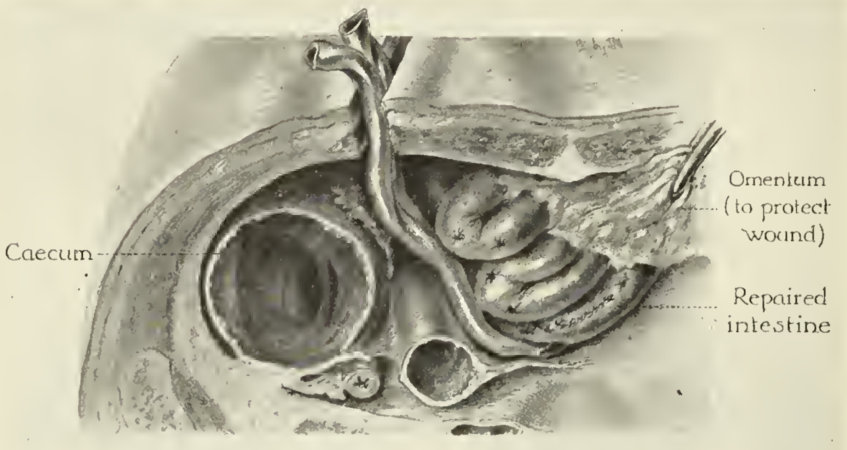
Case 1.—At 8 a. m., on November 15, 1931, a young man, twenty-two years of age, while hunting, carelessly put his No. 22 (long) revolver, cocked, back into his holster on his right side. The revolver went off and the bullet entered diagonally the lower right quadrant of his abdomen. He was rushed to the hospital eighteen miles distant.

X-rays showed evidence of fluid in the abdomen. Evidence of the presence of a metallic foreign body was not definite because of movement and the slow exposure of the portable machine (Fig. 2).

The patient was in fair condition, pulse 80, temperature 97.4. Although there was a rigid abdomen, especially on the lower right, he complained of little pain or discomfort. There was dullness in the lower abdomen. The urine contained no blood. He was not in distinct shock and therefore an operation was performed three hours after the accident.

Under local, gas and ether anesthesia a right rectus incision was made just inside and above the anterior superior spine. The omentum was protruding through the bullet wound. The abdomen contained a large quantity of free blood, clots, and bowel content. Saline solution with suction was used to wash out the abdominal cavity. The ileum was injured and punctured in nine places by the bullet on its diagonal downward course (Fig. 3). The punctures and rents occurred in various places for about three feet along the ileum. One area consisted of an injury to the mesentery for about two inches causing considerable hemorrhage into the abdomen. At this point the bowel was not punctured. At a second area the bowel wall was ripped open opposite the mesentery two inches in extent and near the end of this area three small punctures existed near each other, about the size of a slate pencil. Similar sized punctures existed in other areas (Fig. 4). The cecum was injured but the wall was not punctured. The rest of the intestine was examined, but no injury was found. The iliac vessels were intact. The bullet was not discovered.

All the raw and lacerated areas were carefully stitched. The circulation was somewhat impaired in one area where the bowel had been greatly lacerated. All the areas involved were brought within a small space just below the incision, the omentum used to cover these areas, and four small Penrose drains inserted into the pelvis below the injured coils (Fig. 5).



Position of injured loops of intestine and drains after operation

Fig. 5.

The patient stood the operation very well. There seemed to be little shock.

His temperature rose on the third day to 103 but gradually declined to normal on the fourteenth day. The average pulse rate up to the fifth day was 100 but gradually declined to 80 on the twelfth day. His respirations were normal.

His leukocyte count was 28,000, 10,000, 22,000 and 10,000 on the first, third, eleventh and nineteenth days respectively.

Pain was experienced in the abdomen, back and legs more or less for the first ten days. When the stomach would become distended with gas the pain in the back was more marked as well as restlessness. He had to have from three to five hypodermics for the first four or five days.

Nasal suction was instituted on the third day with marked decrease in the amount of gas and distention, 900 to 600 c.c. of gas being removed daily from the fourth to the ninth day.

No vomiting occurred after the tube was inserted.

The kidney function was good, the output varying from 775 c.c. on the first day to 1,125 c.c. on the fifth day.

The bowels were quiescent the first three days, but from then on the action became normal with one or two stools a day and considerable flatus being expelled for about eight days.

There was marked thirst for the first three days, but after the insertion of the tube this was negligible.

Hypodermoclysis of normal saline in amounts ranging from 1,500 to 2,000 c.c. was given on the first, second, third and fourth days. For the next four days he was given about 750 c.c. by proctoclysis daily besides taking from 3,000 to 4,000 c.c. of fluids in the form of water, tea, orange juice and bouillon by mouth. The average absorption of these fluids from the third to the ninth day was about 800 c.c. After the ninth day the amount of fluids taken by mouth was increased to include beef tea, ginger ale, soups, and eggnogs varying from 4,000 to 6,500 c.c. per day. On the fourteenth day the suction tube was closed two hours and opened two hours alternately and from then on gradually closed at longer intervals until it was removed on the eighteenth day. Thereafter toast, custards, poached eggs and ice cream were gradually added to the diet.

An X-ray taken on the eighteenth day after the accident showed considerable distention of the bowel throughout, but no evidence of the foreign body (Fig. 6).

The wound was in good condition with the exception of a small amount of discharge. The drains were removed gradually, and the wound was healed on about the twentieth day.

The patient left the hospital on the twenty-ninth day and has been well since.

Case 2.—A widow, aged 48, had had an essentially negative personal and family history. She had had no operations or injuries. Her menses had been normal up to a year ago. She had had three children, all normal deliveries.

About a year ago her menstrual periods became irregular, with some menorrhagia or metrorrhagia. There was little or no dysmenorrhea. On January 30, 1932, she was suddenly taken ill with severe sharp pain throughout the lower pelvis, especially on the right side, with some nausea and vomiting. She had considerable uterine bleeding, produced by the slightest straining.

She was moved to the hospital where a flat X-ray (Fig. 7) was taken with the following report: "The findings in the abdomen are those of some fluid together with some medial displacement of the cecum which may be due to fluid or a mass in the lower right quadrant. There is also thickening of the bowel wall."

She had pain upon palpation and percussion over the abdomen with rebound tenderness especially in the lower right quadrant. The abdomen was greatly distended with gas. The cervix was ulcerated and apparently cancerous. The uterus was fixed to a mass in the right side. Diagnosis of possible cancer of the cervix with lymphatic involvement, salpingitis, and acute appendicitis was made.

Her temperature was 99.8, pulse 88, and respirations 20. There was a faint trace of albumin in the urine as well as a rare granular cast, a few pus and blood cells. Her red blood count was 4,070,000; leukocyte count 7,150; P. M. N., 86; small lymphocytes 12, large lymphocytes 2.

An operation was decided upon because of the acute symptoms present and the possibility of appendicitis.

An outer rectus incision was made. Exploration revealed an enlarged uterus fixed on the right side with an infected mass involving the right ovary and tube. The peritoneum was red and inflamed, and the abdomen contained 50 c.c. of sero-purulent fluid. The appendix was congested and inflamed but not ruptured. The infectious material was sucked out, the appendix removed, and two Penrose drains inserted. The abdomen was closed in the usual manner.

Two days after the operation another X-ray was taken which showed a moderate distension of the colon and numerous loops of small bowel. A tube had been passed through the esophagus and the tip of the tube lay in the cardia. There was still some evidence of thickening of the walls of the bowels (Fig. 8).

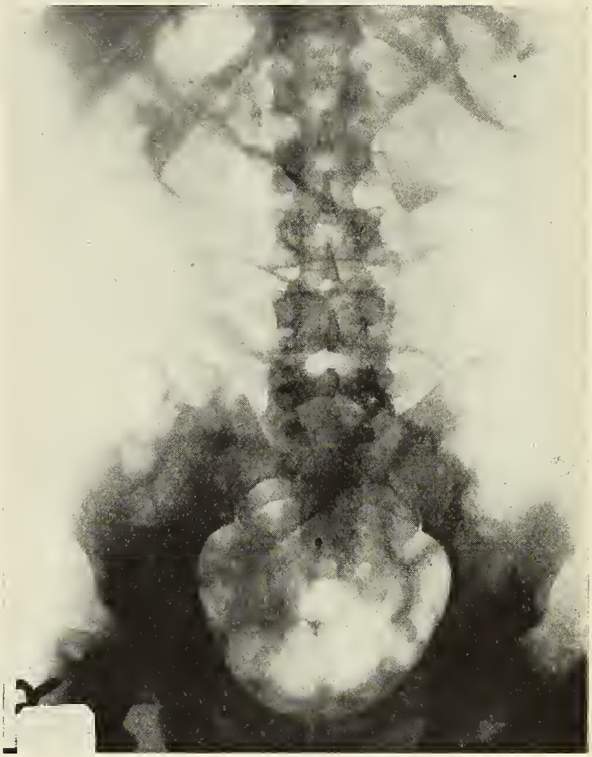


Fig. 6.

On the fifth day after the operation her leukocyte count was 12,750, small and large lymphocytes 13 per cent; P. M. N. 67—somewhat toxic.

She had more or less pain and restlessness when the nasal tube was inserted the second day after the operation, became clogged or worked imperfectly, but after the third day the distention and pain became less so that hypodermics were required only for sleep.

She had a hypodermoclysis of 1,000 c.c. daily for the first three days and averaged about 3,100 c.c. of fluids by mouth up to the seventh day. The absorption was from 100 c.c. the second day to 1,100 c.c. on the seventh day besides what was given by hypodermoclysis and proctoclysis.

The gas removed varied from 300 to 600 c.c. on the third day and gradually declined to 300 c.c. on the eighth day.

The kidney function was practically normal all the time.

The bowel action after the third day was good except on the sixth day there was a tendency for diarrhea.

The nasal suction tube was removed on the eighth day.

Her convalescence was satisfactory from the eighth to the seventeenth day postoperative. The abdominal wound was practically healed except for a slight discharge. Epithelization was nearly complete on leaving the hospital on the twenty-second day.

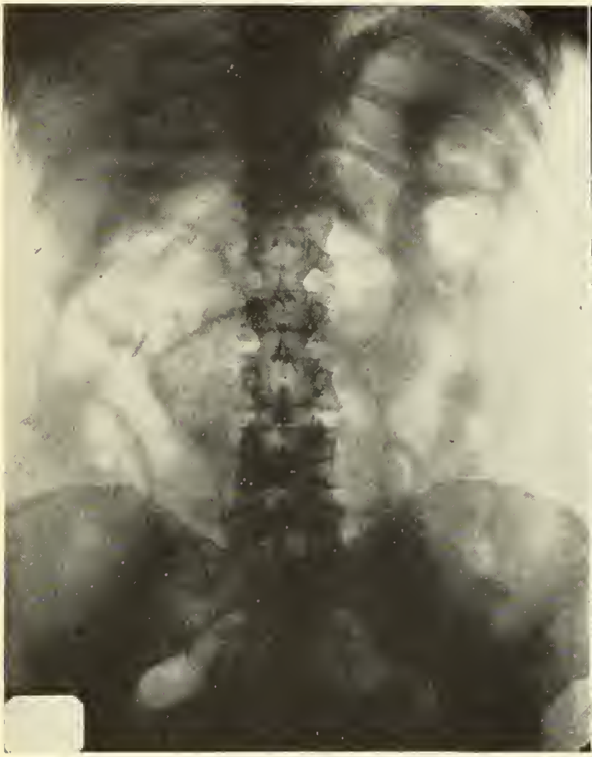


Fig. 7.

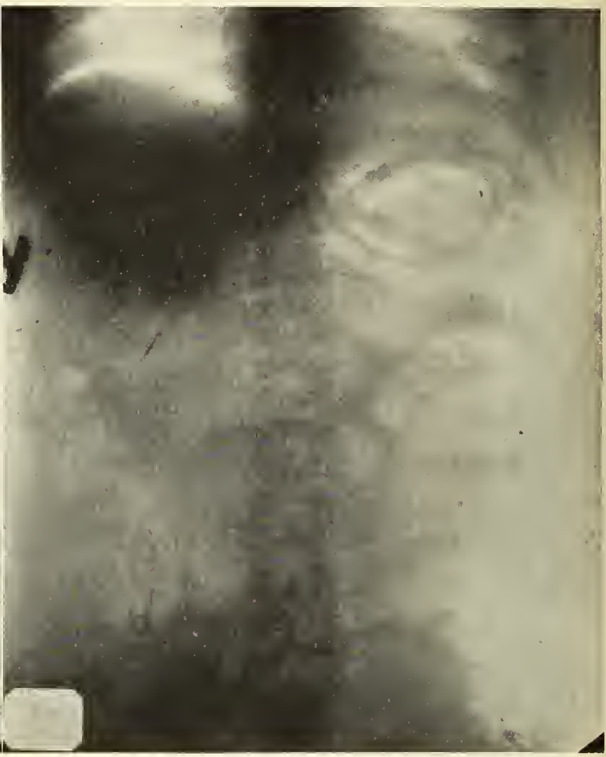


Fig. 8.

Biopsy of the cervical tissue showed a carcinomatous growth which was operated upon with diathermy cautery, and fifty mgms. of radium inserted in the cervical canal for twenty-four hours. Convalescence was satisfactory.

CONCLUSIONS

Continuous nasal catheter suction treatment in postoperative cases:

1. Lessens pain and decreases need of narcotics.

2. Overcomes vomiting, permits early administration of water and other liquids, lessens thirst, and satisfies hunger.

3. Prevents dehydration so that proctoclysis and hypodermoclysis can be discontinued early.

4. Reduces the temperature and pulse.

5. Stimulates the liver and gallbladder function, favors gastric and intestinal secretions, aids in the physiological action of the digestive glands, and in the peristaltic activity of the intestines and early evacuation of the bowels.

6. Removes the regurgitated and toxic fluids from the stomach in obstructive cases, lessens the intra-abdominal tension, thus minimizing the danger of spreading infection and diffuse peritonitis.

7. Is of psychological benefit, increases the comfort of the patient, and permits rest and sleep.

8. Increases strength and vitality, hastens recovery, and reduces mortality rate.

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SOME PUBLIC HEALTH ASPECTS OF PARASITES OF MAN*

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THERE is at present a dearth of information regarding the parasitic diseases in the teaching of public health nursing. Such authorities as Park, Brainard, Wright, Kelly, Bradshaw and others do little more than to mention them. In actual fact there is a growing need for a consideration of the subject due to the increasing possibility of mechanical dissemination of disease from endemic areas. This phenomenon has been noted in the past with plague in California during the early part of the present century, and yellow fever outbreaks in various areas of this country during relatively recent years. The possibility of dissemination of harmful animals is clearly put by Howard (1931) in his semi-popular account "The Insect Menace."

My discussion will be confined as much as possible to local problems. In confining it thus I shall draw substantially upon notes made from six years of observation on local parasitic forms. I shall stress methods of infection and control for it is in applied parasitology that medical-minded people are especially interested.

Most parasitic animals occur in four of the major groups or phyla of the animal kingdom: (1) the Protozoa, or uni-cellular organisms; (2) the Platyhelminthes, or flatworms; (3) the Nemathelminthes, or roundworms; and (4) the Arthropoda, including the insects and their allies. Members of this latter group are of importance primarily as vectors of disease and will be considered here only in that rôle.

PROTOZOA

Not all protozoal infections have been shown to be harmful. However, the incidence of pathogenic and non-pathogenic species is higher locally than one might suppose.

In considering the occurrence of intestinal protozoa two types of evidence may be considered: (1) the sample taken may represent cases showing clinical symptoms making an examination desirable; or (2) it may include all of the individuals in a given area, both the sick and apparently well. The first type of incidence is termed "clinical incidence" and the latter the "true incidence" as pointed out by Brown (1932). Unfortunately no data have been published relative to the true incidence in a Minnesota group. On the other hand, Brown, reporting studies made at the Mayo Clinic, found a clinical incidence of 5±1 per 10,000 for *Endameba histolytica* in 20,975 patients from Olmsted County, examined during the period from 1926 to 1931. Riley (1929) gives another summary of the clinical incidence of protozoal infections in a group studied locally. In a series of 500 cases among ex-service men referred to the laboratory for microscopic examination, 162 were positive for protozoa, exhibiting 206 infections. Riley found ninety-five single infections, thirty-nine concurrent infections with two species, seven with triple infections, and three with quadruple infections. In the 500 cases examined *Endameba histolytica,* the cause of amebic dysentery, occurred in seven cases, or 1.4 per cent. This clinical incidence compares closely with the true incidence reported by Thomas and Baumgartner (1925) who found 1.7 per cent infection in 1,100 inmates of a New York institution. On the other hand, it is much lower than the clinical incidence reported by Kofoid (1926) of the California State Board of Health, who found a 13.1 per cent infection, or by Kessel (1930), in Los Angeles, who found 9.8 per cent infection. These latter reports, however, are from areas where climatic conditions are recognized as more favorable for the perpetuation of parasitic diseases.

Faust (1931) in studies in New Orleans and the American tropics finds a much higher percentage of infection than does Riley. In New Orleans approximately 1,000 persons were studied who were classified as children under twelve years from welfare clinics, a similar group of children from wards in Charity Hospital, and a series from the obstetric service of Charity Hospital. To this group are added data concerning 181 medical students, 243 ambulatory clinic patients and 199 private lay patients. Under six years of age, infection was light (about 3 per cent). It increased up to about thirty years and then decreased at about the same rate as the increase. The highest rate of infection (25 per cent) was found in obstetric cases. Faust (1932) reports two cases of natural infection with this parasite in dogs in New Orleans.

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In addition to *Endameba histolytica* Riley found four other species of amebæ in his studies. *Endameba coli* occurred in 14 per cent of his cases; *Endolimax nana,* 11.2 per cent; *Iodameba bütschlii,* 2 per cent; and *Dientameba fragilis,* 2 cases. These latter three species are all within the size range of the pathogenic species and therefore must be very carefully studied morphologically before a diagnosis is made.

These studies show that amebic dysentery is an important factor in public health even where hygienic conditions are recognized as favorable. Where hygienic conditions are less favorable, and and where winter temperatures are not prohibitive to winter infection more cases occur. While but 1.4 per cent infection looks small, if we consider the clinical incidence of the population as a whole it takes on tremendous magnitude.

The rôle of intestinal flagellates as etiologic agents in gastro-intestinal disorders is not clearly defined. Many workers consider that the so-called "flagellate diarrhea" manifest especially in children is due to *Giardia lamblia.* Other more cautious workers concur with Hegner (1929) in stating that it is not an established fact that this flagellate provokes the diarrhea. There is, however, a certain amount of evidence which might indicate that this flagellate, and others, notably *Chilomastix mesnili, Trichomonas intestinalis,* and the vagina-inhabiting *Trichomonas vaginalis* might be pathogenic. Typical of the positive evidence is that presented by Kessel (1930) in which a higher amount of gastro-intestinal disorder is found among persons harboring flagellates than in groups negative for protozoan infection, or positive for commensal amebæ. Kessel found twice as many children harboring *Giardia lamblia* exhibiting gastro-intestinal symptoms as adults. He also found an increased incidence of *Chilomastix* and *Trichomonas* in cases showing symptoms of gallbladder disease and duodenal ulcer.

Riley (loc. cit.) found *Giardia lamblia* in 5 per cent of his cases, *Chilomastix mesnili* in 6.8 per cent and *Trichomonas intestinalis* in 9.4 per cent. The occurrence of *Giardia* is higher than that reported by Lynch (1928) from northern Texas.

The vagina inhabiting species of *Trichomonas, T. vaginalis,* is found by Dr. Mass of the Swedish Hospital in 90 per cent of the cases of unexplained leukorrhea.

Only one species of ciliate is of importance as a parasite of man. This is *Balantidium coli,* a species also present in hogs. The primary site of infection is the large intestine, although cases have been reported with iliac infection. The host tissues seem to be dissolved by ferments, thereby producing ulcers and subsequent clinical symptoms such as diarrhea. Locally, hogs are commonly infected. Cases have been reported from man in Minnesota, although these are rare. In certain tropical and subtropical areas it is a rather common parasite of man.

In certain areas much of the lassitude of individuals is attributed to one of two well-known diseases. If mosquitoes are present malaria is the probable factor; if absent, the afflicted population usually suffers from hookworm infection. Although Minnesota is far removed from the recognized malarious areas as defined by Maxcy (1923) there have been cases which have apparently originated locally. Through the courtesy of Dr. McDaniel of the Minnesota State Board of Health many of these have been compiled and are here reported.

Since 1913 forty-nine cases of malaria have been reported from Minnesota. While many of these were imported there is evidence that certain ones have originated locally.

A typical case of latent malaria is found in case No. 32, a male twenty years of age, who was enlisted in the Texas National Guard in the summer of 1916. He was in the hospital at that time for five weeks with malaria. After treatment he was released in apparently good health. Shortly after he moved to Minneapolis. On May 5, 1917, he reported at a Minneapolis hospital presenting a typical case of malaria.

Recently a case was reported from Winona which apparently had local origin. During the summer of 1929 a fireman in the employ of the city became ill with malaria. He had not been out of the city for several years. On July 2, 1929, he had severe chills and fever. On July 19 malarial parasites were found in the blood by diagnosticians of the State Board of Health. Following treatment he recovered. This case is thought to be due to the infection of local mosquitoes by tourist traffic from endemic areas. Other cases of this sort are on our local records. It is probable that if it were generally known that the disease may occur here even more cases would come to light.

PLATYHELMINTHES, OR FLATWORMS

Two types of flatworms may affect man. These are the flukes, or Trematoda, and the tapeworms, or Cestoda.

Locally we have little difficulty due to trematode infection in the strict sense of the term. Undoubtedly some are imported in Oriental students, but these cases are so rare as to escape attention. There is, however, a very prevalent type of dermatitis contracted by bathers from our local lakes which the writer and Dr. Greene (1928) have termed "swimmers' itch." This type of infection was found previously in Michigan by Cort (1928) who described it under the name "Schistosome Dermatitis." Cort found the etiologic agent was an immature blood fluke which will bore into the skin of man. The blood flukes, as a group, enter their hosts actively through the skin in the cercarial stage and, if the host is the proper one, they pass into the blood stream to mature. In this case the species is a non-human one which will enter the skin of man, producing the wheals, inflammation and the pustules characteristic of the infection. The organism causing swimmers' itch locally is *Cercaria elvæ*. Cort (1928) found other furcocercous or forked-tailed cercariæ which would produce similar infections. That this type of infection is a widespread phenomenon is borne out by reports of it in England, in Canada, and by letters to the writer from many areas of the United States and Canada from physicians who have noted cases.

Tapeworm infections come from three general sources: (1) fish (*Diphyllobothrium latum*); (2) pork or beef (*Tænia solium* or *Tænia saginata*); and (3), from food contaminated with feces or containing the intermediate hosts of tapeworms.

The two large tænias of man, *Tænia saginata* and *Tænia solium*, are contracted from eating raw or imperfectly cooked beef or pork, respectively. Occasionally these tapeworms are referred to our laboratories for diagnosis. Undoubtedly many instances of these parasites are wilfully concealed, and many are overlooked. In local cattle, taking the north central states as a group, there is an infection of about 2 per cent of the animals which are killed for food purposes, but are subsequently diagnosed by the meat inspector and condemned as human food. In local slaughter houses not governed by the Bureau of Animal Industry regulations, this 2 per cent is not condemned and is a factor in public health.

It seems rather certain from studies of Stiles and others that *Tænia solium* is rare in this country and fast becoming almost a biological curiosity. Its relative rareness is expressed in a statement of a meat inspector of the Bureau of Animal Industry to the writer that he had seen three cases since 1895. Local cases of this tapeworm have been found, however, one in recent years from the Glen Lake Sanitarium.

With *Tænia solium* there is not only the danger of intestinal infection with the adult worm but there is also a grave danger of contaminating food of man with the eggs of this species. Such eggs pass to the intestine, minute larvæ are liberated which enter the blood stream and are carried to various parts of the body. Here they eventually form small cysts about the size of a pea. The danger of these is manifest when they locate in the conjunctivæ or the central nervous system, where they produce a grave type of infection. Infection in man with cysts of the pork tapeworm is clinically termed "cysticercosus."

The fish tapeworm of man, *Diphyllobothrium latum*, is especially prevalent in the Baltic areas, along the coast of the North Sea and in the lake regions of northern Switzerland and Italy. Early reports in this country were from foreigners from infested areas of Europe. More recent reports from along the Great Lakes area have shown this to be an endemic region for this parasite.

The life cycle of *Diphyllobothrium*, unlike most tapeworms of man, involves two intermediate hosts. The adult parasite lives in the intestine of man, bears and dogs. Here it discharges eggs which pass into water, where they hatch into small, free-swimming, ciliated organisms. These are taken up by a water-flea, *Cyclops*, where the first larval stage is undergone. *Cyclops* is then eaten by fish and a second worm-like larval stage develops in the muscles. If these fish are eaten, poorly cooked or raw, infection results.

Locally *Diphyllobothrium* infection is of considerable public health importance. Through the studies of Riley, Nickerson and Magath, this tapeworm is now considered one of our most common species. Riley (1924) reports a total of 65 cases of this tapeworm in man for Minnesota alone. In certain areas practically 100 per cent of the fish are infected with the cystic stage.

Two species of tapeworms, *Hymenolepis diminuta* and *Hymenolepis nana,* which infect man occur in rats and mice.

In rats about the Twin Cities *Hymenolepis diminuta* may occur in from 5 to 95 per cent, depending upon the type of habitat of the host. In garbage dumps and abattoirs the percentage is the lowest, while in grain bins, cattle or hog feed lots practically all of the rats are infected. This variation in percentage is in direct proportion to the prevalence of a proper intermediate host for the parasite. In the case of this tapeworm a wide variety of arthropods have been found to serve as the intermediate stage, namely, certain larval and adult moths, earwigs, grain beetles, which are the most common hosts under certain conditions, dung beetles, larval fleas of several species and a myriapod (Nickerson, 1911). Infection results by the ingestion of these intermediate hosts which had previously fed on the egg of the adult tapeworm. Infection may be contracted by the contamination of food, or by an infant picking up the crawling insect and putting it into its mouth.

Numerous cases of this parasite have been reported from man. Riley and Shannon (in 1922) record 61 cases distributed geographically in Brazil (19), United States (16), India (8), Italy (7), Nicaragua (3), and one each for Argentina, Belgium, Cuba, East Africa, Grenada, Japan, Martinique and the Philippines. More recently (Keller, 1931) has added additional cases to this list until at present some 100 cases of human infection are on record for this parasite. It is of interest to know that during the last decade some thirty-nine cases have been added, twenty-three of these by one worker (Chandler, 1927) in his hookworm studies on some 10,000 individuals in India. The rest of the cases are distributed over the United States. There is little doubt that with more careful diagnoses this parasite will be found to be rather a common one in man.

Hymenolepis nana is likewise a common parasite of rats and mice locally and can be contracted by man. In an examination of some 500 rats the writer has found this parasite in 10 per cent. No local studies have been made on its occurrence in mice, although it is also reported for that host.

Prior to the war this parasite, like *Hymenolepis diminuta,* was considered an incidental parasite of man. The disease factor of the war gave tremendous impetus to microscopic examinations and these studies have led to the conclusion that this is indeed a common parasite of man; probably the most common of the tapeworms. An early report (Frey, 1915) reflects the condition as it is to be found under certain conditions. He found in an examination of 270 children in a Texas orphanage an infection of 32 per cent. It must be remembered, however, that conditions as encountered in an orphanage are much more favorable for infection than they would be in the public as a whole. Such extreme infection would indicate crowding, and certain laxity in the care of the children. Infection with this parasite is by the direct ingestion of eggs.

The rôle of the dog as a carrier of disease is discussed by Joannides and Riley (1925).

Several species of tapeworms of both dogs and cats affect man. These are *Dipylidium caninum* and *Echinococcus granulosus.* Locally there is evidence that the broad fish tapeworm *Diphyllobothrium latum* is harbored in dogs. Another parasite of dogs and cats which affects man is *D. mansoni.*

Infection with *D. caninum,* the double-pored tapeworm of man, is brought about by the accidental ingestion of dog or cat fleas, or of the biting louse of the dog, *Trichodectes canis.* This tapeworm is largely found in infants (75 per cent of cases) and is contracted by an intimate association with pets. Locally *D. caninum* occurs in 25 per cent of the 102 dogs examined and in about the same percentage of cats.

Echinococcus granulosus is a minute tapeworm living in the intestine of dogs and related carnivores in the adult stage, and occurs in man and some forty other mammals in the cystic state. In man the cyst may locate in the brain, in the muscles, about the viscera, in fact in almost any tissue of the body. In size, cysts may become as large as the head of an infant.

Local cases, such as that of Joannides and Riley (1924), are on record. This interesting case was one of a woman forty-five years of age who had an hydatid in the scapular area

NEMATHELMINTHES, OR ROUNDWORMS

Several varieties of roundworms affect man; ome of these are peculiar to him and others ontracted from close association with dogs and ats or through the contamination of food by nice. A curious case of the infection of man by ı mouse nematode is that of Riley (1919). He ound that the comomn mouse oxyurid, *Syphacia bvelata* would produce infection in man.

Most of us recall cases of children with worms." "Worms" usually refer to the pinvorm, *Enterobius vermicularis,* or the large so-alled "roundworm," *Ascaris lumbricoides.* Numerous cases of each of these parasites have ome to my attention during the past few years. While *Enterobius* is usually not considered a serious parasite, *Ascaris* infection may be followed by grave results. Intestinal occlusion and perforation both have been reported for this parasite, and "verminous pneumonia" is one of the well-known symptoms of the infection, resulting from the migratory larvæ of the parasite passing through the lungs. *Ascaris lumbricoides* is morphologically identical with *Ascaris suilla* of the hog. There is, however, a certain amount of evidence which indicates that the two are at least physiologically different. The whipworm, *Trichuris trichiura,* is apparently not especially common in this area. In tropical and sub-tropical areas it is a definite factor in public health.

In addition to the above roundworms there are certain species which occur in man which may be contracted from dogs or cats. These are *Toxocara mystax* and *Toxocara canis,* intestinal parasites of the cat and dog respectively. These, however, are relatively rare. In Minnesota *Toxocara canis* occurs in 27 per cent of the dogs and *Toxocara mystax* in about 30 per cent of the cats examined.

The Twin Cities are far removal from the recognized hookworm belt. Still cases are found here which are of singular interest. During the past few months two such cases have come to my attention. The first was one referred to this laboratory for confirmation of diagnosis by Dr. Mass, pathologist of the Swedish Hospital. The patient was an adult, minister, thirty-two years of age. He had been working in Africa since the fall of 1927. On February 8, 1932, he presented himself for medical attention, complaining of weakness, sluggishness, dullness about the head, with difficulty in thinking. These symptoms began in 1930; since July, 1931, he had been unable to perform any work. His appetite had been fairly good, no blood was evident in the stools, and his bowel movements were quite regular. No nausea or vomiting had occurred. Blood examinations showed a 15 per cent eosinophilia.

On February 12, 1932, three doses of oil of chenopodium, each 1.5 c.c., were given by mouth. This was followed by a severe gastro-intestinal upset. Then 1.0 grams of hexylresorcinol was administered. No intestinal inconvenience resulted. Following a purgative of magnesium sulphate hookworms were isolated from the stool.

Subsequent to treatment the patient has been seen at weekly intervals and each time shows improvement. His speech is easier, he feels stronger, and the abdominal pains have disappeared. He has gained 7 pounds in weight.

The second case of hookworm is now under observation. This is a male, aged 19, who had lived in Porto Rico from 1922 to 1928. Four years ago he came to this area, where he has remained ever since. At the age of fourteen or fifteen he was treated for hookworms. After treatment he remained in Porto Rico for one year and then moved to Madison, Wisconsin, for a period of two years. He then came to Minneapolis, where he has remained for two years. During the past four years he has not been in the hookworm belt.

He came to the Students' Health Service recently complaining of malaise, sluggishness, and "not feeling up to par." The blood readings showed an eosinophilia of 22 per cent, a hemoglobin of 90 per cent and a total leukocyte count of 8,100. Stool specimens were submitted and larvæ were found which were diagnosed by Mr. Wallace as *Strongyloides.* A subsequent stool referred to the writer and examined about three hours after being passed showed also numerous ova of *Necator americanus.* It is reasonable to suppose, although not absolutely certain, that the above infection was contracted in Porto Rico some four years ago and has been present since that time. Similar cases have been reported by other workers. The Caldwells (1931) find no evident loss of hookworm burdens during a period of four years.

The question may arise: What is the present status of hookworm infection? Stiles (1930, 1932) very admirably states the case. He finds that among boys of school age, hookworm infection is still widespread, geographically, in our Southern States. This is not only true in the South but has been found by other workers to be the condition elsewhere in tropical and subtropical areas. In 1932 Stiles states: "In 1902, the first task was to convince an unbelieving public that hookworms were not a myth but a serious and widespread menace to health: in 1932, the first task is to disillusion a credulous public which believes that hookworm disease has become very rare in the United States—a belief not supported by theoretical considerations, clinical observations, or microscopic examinations."

One of our major local parasite problems is trichinosis. It occurs in about twelve per cent of our local cats and up to 33 per cent of the rats. Recent epidemics of this disease in man have been compiled and placed at the disposal of the writer by Dr. McDaniel. The essential details are as follows:

Case 1.—Miss W. visited the home of E. S. in Fargo, North Dakota, October 22 to 25, 1922, returning home on the latter date. She ate sausage while a guest of E. S., and brought some of it home with her for her parents. This was promptly eaten. The sausage was in casings, smoked, but uncooked. Following the ingestion of it there occurred in all five who had eaten, an edema, loss of appetite, malaise, nausea, cramp-like pains in the abdomen, and constipation. Mrs. W. had a temperature of 100°-104° F. for a few days. After a few days muscular pains were felt, especially in the calves, and all patients raised blood-stained sputum. The recovery was gradual: eosinophilia ranging between 13 and 28 per cent.

Case 2.—About November 1, 1925, there was prepared in the home of H. K., Sioux Valley Township, a batch of smoked sausage from a home-killed hog. This was eaten uncooked by all in the K. family (twelve individuals) but a fourteen year old boy, L. They had anorexia, slight fever, and gripping abdominal pains as the initial symptoms. A few of them vomited. Later the temperature rose to 101° to 105° F., the pulse was rapid, and the edema of the face became more pronounced. During the third week all had a bronchial cough. The eosinophilia ranged from 4 to 64 per cent in the individuals infected. Three fatalities occurred in this family, one on December 11, one on December 13, and one on January 3.

In addition to these cases a sister of Mrs. K. ate some slices of the sausage, two school children ate some of it given them by the K. children, and some of it was obtained by the family of Mr. W. In the latter family of six, two children who did not eat sausage were not affected. All the others presented mild cases. Another sister of Mrs. K. later ate sparingly, and moved to Iowa, where trichinosis was diagnosed.

Case 3.—Seventeen cases at Two Harbors, Minnesota, were reported February 9-10, 1930, thirteen of which were school teachers. All had partaken of a lunch of ham sandwiches, angel cake and coffee served at the Teachers' Whist Club January 13th. All became ill. One pound of boiled ham used was run through the meat chopper at the request of one of the party. Although the dealer insisted that the chopper had been cleaned before using, trichinosis resulted. It was found that the chopper would retain a quarter of a pound of meat and had probably been used previously to grind raw pork. Symptoms were typical as in the previous cases. Eosinophilia ranged from 14 to 40 per cent.

There is no doubt that many cases of trichinosis go undiagnosed. Where studies have been made on man, post-mortem, surprisingly high rates of infection have been found, and in tracing the histories of these individuals vague recollections of rheumatic symptoms have been described. Queen (1931) secured 344 diaphragms from necropsies in Rochester, N. Y., and found a 17.5 per cent infection. In another series of 58 diaphragms in Boston, 27.6 per cent infection was noted. In none of these cases was there any record of diagnosed trichinosis.

It can clearly be seen from these studies that man is continually menaced by great numbers of parasitic diseases, most of which are overlooked by the average medical practitioner. Domesticated animals, such as the dog and cat, aside from being ideal pets, aid in the dissemination and the perpetuation of such diseases as tapeworm infections, roundworms infections, amebic dysentery and trichinosis. Likewise important infections in man may be contracted from rats and mice. In addition to transmitting numerous helminth infections, rats can experimentally be infected with *Endameba histolytica* (Kessel, 1923, *et al.*) and may be, like the dog, an important reservoir for that infection. The high incidence of trichinosis in local cats and rats is a real menace to public health.

Besides having certain local diseases of importance, modern transportation favors the importation of tropical diseases which should give us greater concern. If their presence is recognized by the general practitioner much of the confusion existing in diagnosis could be eliminated.

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MAKING "THE PUNISHMENT FIT THE CRIME"

A recent article in *The Lancet* casts an interesting light on the modern sense of values. An untrained layman, who had appropriated the name and degrees of a distant physician, was finally discovered in his impersonation. Although he had practiced medicine unlawfully for years, even posing as an expert witness in the courts, the total penalty for his grave offenses was three years' penal servitude.

In commenting on this episode *The Lancet* draws some interesting comparisons between the penalties for falsely representing oneself to be qualified in various professions. A fine of twenty pounds is considered sufficient for fraudulently holding oneself out as a physician. Architecture fares better, with a fine of fifty pounds for the first offense and one hundred for subsequent violations. To dentistry goes the deepest obeisance, with a penalty of one hundred pounds. *The Lancet* draws the only possible conclusion. "It is more than twice as serious, therefore, to pretend to be a registered architect and five times as serious to pretend to be a dentist, as it is to pretend to be a registered medical practitioner." A sense of proportion is unfortunately no constant attribute of the law.

Americans cannot afford to scoff at Great Britain in this respect—our own legal structure is too definitely vitreous. The case cited by *The Lancet* is typical of the reluctance American as well as British courts show to invoke a really deterrent penalty for violation of the medical practice laws.—*New York Med. Week*, March 26, 1932.

MONTGOMERY WARD & COMPANY WITHDRAWS LABORATORY SERVICE

Following publication of the report of the A. M. A. Chemical Laboratory relative to its survey of the urine examining service conducted by Montgomery Ward & Company many physicians wrote to the firm asking for an explanation of this project. In reply a letter by the president of Montgomery Ward & Company has been sent to many physicians and stockholders in which it is stated that the urinalysis service has been discontinued. (Jour. A. M. A., May 21, 1932, p. 1813.)

PRESIDENT'S LETTER

WITH the world still in the throes of a planet-wide depression we can be certain that proposals for various forms of insurance will be made to the different legislative assemblies, with the aim of affording relief to those most acutely stricken. Undoubtedly health insurance under either national or state control will be one of the types proposed.

The medical profession should keep clearly in mind certain fundamentals. The various countries, when they adopted health insurance, assumed that the incidence of sickness and the cost of medical care could be accurately calculated by statisticians, and that the data so obtained could serve as a basis of estimating the cost. This has been proved fallacious because the number of cases of sickness per year has rapidly increased under health insurance. When health insurance enters, the will to get well diminishes and withers, especially in times of stress when the cash payment during illness is so helpful to the family budget. This fact is well known to all medical men who have to do with industrial insurance, but it is largely ignored by politicians and social workers. As a matter of fact, no health-insurance law has been formulated primarily as a health measure; they all have been enacted to meet the problem of poverty in time of sickness. No figures have been given that show that under health insurance either the health of the people is better or that there is a lessening in the number of days of sickness per capita. Neither is there any indication that the decline in the death rate is any greater in those countries which have health insurance laws than in comparable commonwealths without such laws. Improvement of health, with consequent lessening of illness and lowering of the death rate, are, after all, the goals that the medical profession is aiming at, and it should not be deflected from its purposes. The program as outlined and advocated by our recognized agencies, wherein policies of public health education, such as examination of school children, care of the infant, and hygienic measures are all advocated, should be pushed vigorously.

Although the attitude of many members of our profession is unfavorable to health insurance, we must bear in mind that there is no real opposition to the principle of health insurance on the part of the profession in the countries where it exists. While there is a wide variation in professional incomes under insurance in these countries, it appears that the average physician is paid better than he was before.

It behooves us, therefore, to acquaint ourselves with the intricacies of the various plans in other countries. The facts are that the evils of insurance decrease in proportion to the degree in which responsibilities are intrusted to the medical profession. The countries wherein the working of the insurance plan runs the smoothest are Denmark, France, Great Britain and Sweden, where responsibility is so placed. We must develop the leadership to meet the situation. The Minnesota State Medical Association has a number of members who are giving much thought to these problems, and when the time comes, as it surely will, for discussion of them with our state legislators, these members will have information and knowledge that will be helpful to all concerned. Our legislative committee already has the confidence of the majority of our legislators and will be looked to for advice.

The trend in medicine, as in other lines, is social, and whereas in the past we have accorded recognition chiefly to those men who have been leaders in the scientific affairs of our profession, we must now give due credit to those who are active in the social phases, and look to them for leadership.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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DR. ROBERT EMMETT FARR

The recent premature passing of Dr. Robert Emmett Farr of Minneapolis demands some mention in our pages of the active part played by Dr. Farr in the first years of the existence of the Journal.

In that period of travail, pending the birth of Minnesota Medicine, Dr. Farr was one of those who visioned a state medical journal representative of the medical profession of the state as a whole, owned and controlled by the Minnesota State Medical Association, and ethical in its advertising department. Dr. Farr was one of those who could put aside minor considerations in order to attain the really worth while objective—a state owned and controlled journal.

Serving for eleven years as an active member of the Editing and Publishing Committee and as the first committee chairman, he was devoted to the interests of the magazine and gave freely of his valuable counsel.

The support of a man like Dr. Farr was inestimable. He was much interested in the welfare and growth of the Journal and, as became his nature, was not averse to a fight for what he thought the right course. He was ever ready to see the humorous side of a situation and had an inimitable way of relating a comical incident.

The tragic late years of Dr. Farr's life are well known to his many friends and acquaintances. Fate seemed against him. In spite of mental and physical suffering his indomitable will enabled him to continue to some extent his scientific work.

Minnesota Medicine is proud to be numbered among Dr. Farr's many friends.

EDUCATING THE DENTIST IN PROCTOLOGY

Recently the following printed letter was received by a Twin City dentist:

"In reading over the enclosed reprint on the Postoperative Care of Rectal and Anal surgical cases, it becomes evident that the care of Rectal diseases is a specialty which requires not only training in this field but equipment adapted to this particular work.

In many ways the position of the D.D.S. and the physician specializing in proctology are analogous. Patients go to a dentist because they recognize him as a man with specialized training in the oral field; they would not expect to get the same high grade of service in a dental problem from their family physician because they know his training and equipment are not adapted to this work.

The thought occurs to me that the D.D.S. who is familiar with these facts will be in a better position to refer any patient he knows to be having rectal trouble to someone having the requisite training and facilities to do this work most effectively. I will attempt from time to time to mail you reprints of papers published under my name in the current medical literature pertaining to rectal diseases.

Yours very truly,"

So our dental confreres are being initiated into the ancient and holy mysteries of proctology via the well-known and widely used reprint route, which causes us again to become acutely conscious of the discouraging truth that we always seem to be peacefully slumbering when old man opportunity rings our doorbell, and when we finally do arouse ourselves we get, instead of the cordial handshake, a bang on the head with a stuffed club, which is the usual fruit of indolence. This time we haven't been caught napping. We are, so to speak, up on our toes; we perceive faint but at the same time very definite glimmerings of a great idea in this newly-opened field of interprofessional relations. In fact, we can see boundless wastes which haven't been charted, the fathomless depths haven't been plumbed . . . in this connection we stand precisely where the radio did when Paul Revere mounted his horse and went calling that night in Middlesex. "Beyond the Alps," Napoleon told his troops, "lies untold wealth." Onward then, to the lush valleys of interallied contacts; let no man shirk his duty.

Think of it; A hundred thousand park policemen leisurely sipping their morning coffee, opening their mail and finding an article on "Gonorrhea and bosky dells." Imagine the western plains teeming with sheep-herders who are hungering for a well-written arbeit on "What a sheep-herder should know about sex." Consider the joy of a member of the American Association of Allied Peanut-Salters, Local No. 514, as he eagerly devours an article on the diagnosis of diabetes. Is this progress? Why, the thing is practically limitless . . . the immensity of the project frightens us. When it comes right down to brass tacks, what do bill-posters know about varicose veins, or pneumothorax, or multiple sclerosis? Candor compels us to answer, nothing. What about street-car conductors and thrombocytopenia? Goodness knows, that, what with the depression and the hot weather and all, they are having enough trouble without this additional handicap. Think of the thousands of moving-picture ushers who are daily doing their best, giving their all, and being forced to struggle along in complete ignorance of tularemia and coronary thrombosis. It's appalling!

However, as long as we were smart enough to think of it we are going to be smart enough not to divulge any more of the details of the plan. Besides, we intend to have it copyrighted, so remove that gleam of avarice from your eye, it's no use. Where the thing is going to eventually lead us, we can't be certain, but as Alice said to the Cheshire cat in "Through the Looking-glass," "Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the cat.

"I don't much care where," said Alice.

"Then it doesn't matter which way you go," said the cat.

JONATHAN CARVER

I, John Lettsom
Blisters, bleeds and sweats 'em;
If after that they please to die,
I, John, lets 'em.

This doggerel, one of several penned at the expense of John Coakley Lettsom, a London doctor of the eighteenth century, is of special interest to Minnesotans, because of Lettsom's relations with that intrepid explorer of this Northwest, Jonathan Carver. Supposed to have first met Carver in the guise of a highwayman, Lettsom is said to have given the financially embarrassed explorer assistance, and cared for him in the illness from which he died in 1780 "absolutely and strictly starved." It was Lettsom who at his own expense published the third edition of Carver's Travels to assist the widow and children of the explorer. A perusal of one of these editions furnishes fascinating reading to one historically minded. Descriptions of native vegetation, animal and bird life, the Indians and their languages, prove Carver to have been an unusually intelligent observer and facile writer.

A native of Connecticut, where he was born about 1710, he was placed with a doctor in Elizabeth Town, Connecticut, but at the age of eighteen he became a soldier. His experiences in Indian warfare doubtless were seasoning experiences for his later attempt to find a water route to the Pacific by the way of the Great Lakes and the Oregon (now Columbia) River. His book indicates that he had a very accurate idea of the waterways of Wisconsin and Minnesota, but his conception of the distance of the source of the Columbia River from Minnesota was grossly in error.

As his book nicely describes, Carver proceeded by canoe up Green Bay, through Lake Winnebago, up the Fox River and thence by portage to the Ouisconsin (Wisconsin) River. Down the Wisconsin to Prairie du Chien, thence up the Mississippi to Lake Pepin, the beauty of which greatly impressed him, he describes the unique cave in the cliff below the Indian Mounds in Saint Paul known as Carver's Cave to early Saint Paulites, and the then beautiful Saint Anthony's Falls, located somewhat below their present site in Minneapolis. Proceeding up the Mississippi as far as the Rum and Saint Francis Rivers, he returned to the Minnesota River (then known as the Saint Pierre), following up its course some 200 miles.

Friendly with the Indians, Carver was supposed to have received a deed to a large tract of land to the east of the Mississippi River extending from Lake Pepin to Saint Anthony Falls. This supposed deed led to many hearings in Congress between the years 1806 and 1824 due to efforts of Carver's descendents to prove title to the land. Congress ruled against the validity of the claim.

Although Carver's two and a half years of exploration of this part of the country in 1766 followed Father Hennepin's visit by about 100 years, his accurate record of his observations furnishes a valuable record of the district before it became settled by the white man.

MISCELLANEOUS

SOCIAL INSURANCE UNDERMINES NATIONAL CHARACTER

EDWARD H. OCHSNER, M.D.
Chicago

Parasitism is today the corroding canker of modern civilization and anything which favors its growth and dissemination should be unequivocally condemned and most vigorously opposed.

The proponents of Compulsory Health Insurance or National Insurance, as it is called in England, reiterate again and again that these and the dole are totally different. In name and administration, yes; in effect, no. They both encourage people to want something for nothing or much for little, which in effect makes parasites out of them. Almost endless illustrations supporting the statement that Compulsory Health Insurance and the dole are alike in effect could be produced but one will have to suffice. Liek, in his book, recounts the following experience he had while a Krankenkasse physician in Germany. A middle-aged man came to him for an examination with the view of securing sick benefit. Liek examined the patient carefully; could find nothing the matter with him; in fact, found him an unusually well-developed and robust individual. He told the man the facts and elicited the following story. The man told Dr. Liek that he was the only man in his village that did not get some kind of a government stipend, sick benefit or dole or pension and that everybody was ridiculing him because of this.

No one who is at all familiar with Bernard W. Shaw's writings will ever accuse him of being in favor of the present economic system in England. He has the following to say about the dole: "The Labor Party has just twisted conditions all around. They taxed people who live on unearned income, and create their own leisured class—people who live on the dole. The dole is not much but if you have four or five in one family living on dole you have a hostel of leisured people living very well. That must cease."

The whole Social Insurance scheme is based on the ethically indefensible theory that individuals are entitled to things that they have not earned and on the politically unsound doctrine that society owes every citizen a comfortable living whether or not he repays society by doing his fair share of the world's work. Under Compulsory Health Insurance the individual who works only half-time is entitled to just as much free medical service and is likely to get much more in sickness benefits than he who works full time. Not only this; it actually encourages immorality and riotous living as the following personal experience well illustrates. As a young man I worked two seasons in a lumber camp. The camp in which I lived comprised between thirty-two and forty men. Of this number only one did not use intoxicating liquor; only two did not use tobacco; and half of the men spent their hard-earned wages either at the saloons in the nearby town or went regularly to the Island or did both. Those who are familiar with the Islands of the upper Mississippi River need no explanation as to why they went there. I wonder how Health Insurance, insuring these men for loss of time and providing free medical care for them, would have prevented their doing the very things which were the cause of much of their sickness. For my part, I believe that a larger per cent of them would have gone to the Island if they had felt that they would be protected against loss of time and that they would receive free medical care if they became sick. Health Insurance would actually have increased not only sickness but immorality as well in this camp.

A recent survey of five thousand students at the University of Minnesota found only ten, or two per thousand, with positive Wassermanns. Careful surveys in various parts of the country indicate that about three per cent, or thirty per thousand, of the general population of the United States is syphilitic. A Wassermann examination of three thousand prisoners in the Southern Illinois Penitentiary revealed the fact that three in ten, or three hundred per thousand, were syphilitic. This same ratio undoubtedly pertains to the class most criminals come from and raises the average in the general population.

It is a well-known fact that alcoholics and those suffering from venereal diseases are much more liable to loss of time from sickness than are those not so affected. What right has any just government to take of the earnings of the two first groups without their consent and give them to the third group? A just and humane government protects the weak from oppression and exploitation by the strong and unscrupulous; but a just and wise government does not penalize the strong, industrious, clean-living and thrifty and favor the weak, lazy, shiftless and immoral. Giving the weak, lazy, and shiftless undue advantage over the strong, industrious, and thrifty actually penalizes and handicaps the latter, interferes with the law "of the survival of the fittest," and must eventually lead to race degeneracy. If the white race persists in this course long enough, the "yellow peril," so often glibly and jokingly mentioned, may become a real menace to western civilization.

All independent writers on the subject state, and even the proponents of Compulsory Health Insurance have to admit, that it has tremendously increased occupational neuroses, and that is just what was to be expected and was expected by those who know human nature and can see just a little further than the ends of their noses.

The following quotation from a paper by William H. Hicks is pertinent: "In accident cases, where the question of compensation is involved, conditioned reflexes are sometimes created by the patients' environment that not only retard recovery but instigate additional symptoms; or may lay the foundation for successful malingering."

One of the worst features of Compulsory Health Insurance is that if continued long enough it will crush out of character the three I's—Independence, Industry and Integrity. Such schemes are as Guglielmo Ferrero, the eminent Italian historian, rightly says, "artificial," and "While they tide over trifling evils of the moment, they lay up for the future troubles and difficulties and dangers of infinitely greater gravity."

(To be continued)

UNDULANT FEVER

Several observers have reported favorable therapeutic results with specific Brucella melitensis (abortus) vaccine therapy. Two Brucella melitenses variety vaccines have been accepted for New and Non-official Remedies. (Jour. A. M. A., May 21, 1932, p. 1832.)

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

RESULTS!

Scarcely more than a year has passed since the House of Delegates of the American Medical Association called attention, through the medium of the now famous "Shoulders Plan," to the pernicious and then apparently triumphant policy of bureaucratic governmental medicine set up in the statutes for relief of war veterans.

Has anything been accomplished? Sometimes, no doubt, the individual "tax-paying" member of the component societies wonders where his money goes, wonders what concrete facts can be adduced to prove that his mite in the cause of organized medicine is really bringing results in the advancement of the science and in the protection of the American principle of freedom to heal the ailing. In the matter of veterans' legislation, often referred to in these columns, there is already impressive proof of the efficacy of organized effort in behalf of scientific medicine.

The Congress just adjourned has passed *NO* bill for further federal hospital construction. The Congress has turned thumbs down on *every* attempt to enlarge the bureaucratic intrusion on the private practice of medicine. Incidentally, it is interesting to note that members of the Minnesota Association have been active and important figures in the national Association's fight for freedom of medical practice.

Although the recent Congress has not reduced in any measure the medical aid to the non-service connected veteran, the point is that this Congress, for the first time since the war, has refused to enlarge upon these benefits.

It is of interest to note that the veterans themselves are opposing benefits for non-service connected disabilities as disclosed in the recent petition, signed by thousands of actually war disabled soldiers, sailors, and marines, which has been presented to President Hoover. Read, and see the results:

"This document is directed to showing that not less than $450,000,000 of the $928,387,795 appropriation is for veterans who in fact suffered no disabilities in war service.

"The petition has met with nationwide response and is daily being signed by thousands of citizens without regard to party or differences of opinion on any other issue."

This petition goes on to state:

"We petition for the elimination of all expenditures for veterans of the World War who did not in fact suffer disability in war service. We petition for a return to the sound policy in which the World War veterans' legislation was first conceived—just and liberal compensation to the dependents of those who lost their lives in war service and to the veterans who in fact suffered some disability in the war. . . .

"It is believed, on the basis of sound medical judgment, by the substitution of expert medical advice rather than arbitrary Congressional decrees, not less than $125,000,000 could be eliminated from this item in the fiscal year 1933."

The petition we refer to was presented to the President on behalf of the "National Economy League." The Secretary of the National Economy League who presented in this petition the actual aims of many of the disabled veterans is Captain Archibald B. Roosevelt. The same "Archie" Roosevelt, who, at the age of twenty, led an infantry company into the hell of the Argonne and came out, a disabled veteran, an authentic hero in American military history. The Captain is a son of the Colonel who led the charge on San Juan Hill, President Theodore Roosevelt.

To be sure, many of us feel that the National Economy League would do a greater service if it would as carefully investigate economies to be made under the existing system by utilization of civilian medical and hospital facilities. Such a plan would eliminate the tremendous bill for new federal hospitals and their maintenance without any dislocation of already awarded benefits to veterans.

OF GENERAL INTEREST

Dr. H. E. Sisk, university of Minnesota, 1931, is now ocated at Mazeppa, Minnesota.

Mr. Charles Perry Fisher, who has served for fifty ears as Librarian of the College of Physicians of Philadelphia, has retired.

Dr. Henry E. Michelson, of Minneapolis, presented hree papers before the annual meeting of the Northwest Medical Society, held recently at Spokane, Washngton.

Dr. Harold E. Hullsiek, formerly with the Miller Clinic, Saint Paul, has opened offices at 326 Lowry Medical Arts Building, Saint Paul, for the practice of surgery and proctology.

Following the publication of the report of the A. M. A. laboratory of its investigation of the urinalysis service conducted by Montgomery Ward and Company, the management of the mail order house has announced the discontinuance of the service. After all, urinalysis s a part of the practice of medicine and the interpretation of a report, if not the actual performance of the examination, requires medical training.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

NATUROPATH LOSES IN MANDAMUS SUIT

State ex rel. Shenk *vs.* Basic Science Board

On Monday, May 23, 1932, the Honorable Arthur W. Selover, Judge of the District Court, entered an order sustaining the demurrer previously interposed on behalf of the Basic Science Board in the above entitled law suit. Judge Selover also dismissed the plaintiff's case. The relator, W. W. Shenk, who claims to be a naturopathic physician at 3561 Minnehaha Avenue, Minneapolis, had obtained an alternative writ of mandamus requiring the Basic Science Board to either issue him a certificate of registration in the basic sciences without examination, or show cause for not so doing. The case was a test case designed to determine whether or not naturopaths, so-called, who were practicing in the State of Minnesota in 1927, at the time of the passage of the Basic Science Law, were entitled to certificates without an examination.

The demurrer was interposed by the Basic Science Board challenging the sufficiency of the relator's petition and setting forth that naturopaths who were practicing as such on May 1, 1927, were actually violating the medical laws of this State. The matter was submitted to the Court on oral argument and by brief on April 22, 1932, with the foregoing results.

The legal effect of Judge Selover's ruling is that naturopaths are not entitled to practice healing in the State of Minnesota without first having obtained a Basic Science Certificate and that certificate must be obtained by examination in the Basic Sciences. It has been subsequently announced that an appeal will be taken by Shenk to the Supreme Court of Minnesota. The Basic Science Board was represented by Henry N. Benson, Attorney General, James E. Markham, Deputy Attorney General, and F. Manley Brist. The relator was represented by the law firm of Nash and Nichols of Minneapolis.

NATUROPATHIC "SURGEON" FINED TWO HUNDRED DOLLARS

State of Minnesota *vs.* Ziegler

On June 15, 1932, the Honorable Julius E. Haycraft, Judge of the District Court of Fairmont, Minnesota, imposed a $200.00 fine on Fred Ziegler of Elmore, Minnesota, for practicing healing without a Basic Science certificate. Ziegler, sixty-three years of age, a farmer by occupation, but who claims to be a naturopath, and who has been making a living by bleeding and cupping patients, was arrested on June 13, 1932, on a complaint filed by Mr. Brist, representing the State Board of Medical Examiners. Ziegler informed the Court that he had an eighth grade education in Germany and has no medical education, except that he holds a degree of Doctor of Naturopathy obtained at a school in Minneapolis.

This is the second trip before the Court for the defendant, Ziegler having been fined $500.00 on June 11, 1930, by Judge A. B. Gislason at New Ulm for practicing without a license. Before imposing sentence Judge Haycraft placed the defendant under oath and inquired as to whether or not Ziegler intended to comply with the law in the future. The defendant positively stated that he would not practice healing in any manner whatsoever.

Splendid coöperation was received in this case from H. C. Lindgren, County Attorney of Faribault County, and Sheriff W. H. Keigley.

OBITUARY

Dr. Robert Emmett Farr

(1875-1932)

In the passing of Dr. R. E. Farr, Minneapolis and Minnesota lose one of their foremost figures in the development of surgery and especially local anesthesia. Dr. Farr was born at Montello, Wisconsin, in 1875, his parents being of Irish descent. He received his early education in the schools of Wisconsin and graduated from Rush Medical College of Chicago in 1900. He served as interne in St. Mary's Hospital at Minneapolis, where he became acquainted with Dr. James Dunn, at that time an outstanding surgeon in Minneapolis. Dr. Farr subsequently became an assistant and partner of Dr. Dunn up to the time of Dr. Dunn's death.

Dr. Farr was married to Miss Mary Scallen, to whom one son, Paul, was born. Dr. Farr was thoroughly devoted to his family but suffered the great sorrow of losing both his wife and only son before his death. Dr. Farr's death terminates entirely that branch of the Farr family.

During his life, Dr. Farr devoted all of his time to the advancement of surgery and local anesthesia. Early he became interested in the development of the latter and pioneered in its advances. He was constantly performing operations under local anesthesia that were not done elsewhere in the hope of developing the method and extending the realm of its possibilities. Many hours were spent in the anatomy rooms and the experimental department of the University in anesthesia research. Much research was carried on with his own private facilities and at private expense. So well known did Dr. Farr become in the development of his art that he had almost daily visitors from all parts of the United States and from many foreign countries. Doctors from England, Canada, France, Australia and Germany frequently came to his clinic and spent many hours learning his technic and watching his operations. Dr. Farr spent a great deal of time and a large amount of money in the development of special retractors, special instruments for bone surgery, special operating room lights, but most of all in the development of a local anesthesia injector. This injector he manufactured and marketed personally because of his desire to supervise its manufacture rather than permit it to be commercialized. Many reels of motion pictures were taken at personal expense for educational purposes. These reels have been exhibited before some of the largest societies of the United States, both East and West. It was Dr. Farr's desire that these films be left to the profession, and available for educational purposes.

Dr. Farr continually contributed to medical literature; he wrote many articles on the repair of the cleft palate, abdominal surgery, but most of his articles were written upon the use of local anesthesia and the improved surgical technic which he recommended to render this anesthesia more practicable. Dr. Farr's textbook on practical local anesthesia has been acknowledged throughout the world as one of the best. For his pioneer work on local anesthesia, Dr. Farr's name was recommended for the Nobel prize, one of the outstanding awards for advancement in science. Although he never received this recognition, the recommendation came from several prominent societies throughout the United States.

Dr. Farr was a man of personality, ambitious, energetic beyond measure, and always generous. He took a very active part in the development of the Minnesota State Medical Journal and served for a number of years on its editing and publishing committee. He enjoyed an argument, and when he thought he was right he was firm in his stand, and many times has he been heard to commend others for a similar stand and the courage of their convictions, even though they took issue with his ideas. Only those who knew him best are familiar with the fact that he helped to put a number of students through medical school, that he loaned numerous recent graduates sufficient money to get started and that he frequently paid the rent, and helped other physicians when they were sorely pressed. This generosity was never known to the profession.

In his college years, Dr. Farr was a great athlete, a captain of the Rush Medical football team and football coach for Macalester College. A strong, robust young man, later, however, he became the subject of great pain and practically all of his research and greatest efforts were performed under this severe handicap. During the last four years of his life, he was virtually confined to his home by great suffering, during which time, however, he completed the publication of the second edition of his book and wrote the treatise on local anesthesia for a great system of surgery. Only one with his perseverance and indomitable courage would have continued to produce under such a handicap.

Dr. Farr was a past president of the Hennepin County Medical Society, a member of the American Medical Association, Minnesota State Medical Association, Minnesota Academy of Medicine, Western Surgical Association, American Association of Obstetricians, Gynecologists and Abdominal Surgeons, and a Fellow of the American College of Surgeons.

Dr. Farr's death occurred on June 30, 1932, at St. Mary's Hospital. Funeral services were held on July 2 from the Basilica of St. Mary's, well attended by a host of his medical friends and colleagues.

Dr. John Leonard Everlof

1888-1932

Dr. John Leonard Everlof, member of the staffs of Swedish and General Hospitals, Minneapolis, and a lifelong resident of Minneapolis, died Tuesday, July 12, 1932, at his home in Minneapolis at the age of forty-four years.

A practising physician in the city for the past twelve years, Dr. Everlof was educated at the University of Minnesota, New York University, and the Jefferson Medical College of Philadelphia.

He served as a medical officer in France during the World War and was a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations, and a Fellow of the American College of Surgeons. Dr. Everlof also was a member of the Minneapolis Athletic club, the University Club of St. Paul, and the Interlachen Country Club.

Surviving him are his wife, Helen; daughter, Sally; his sister, Mrs. T. R. Dahl of Cleveland; and a brother, Sherman, of Philadelphia.

Dr. James Hynes

(1873-1932)

Dr. James Hynes, physician and surgeon in Minneapolis since his graduation from medical school in 1898, died while in his office Thursday, June 7, 1932. He had been in poor health but had continued his practice until a week before his death.

Dr. Hynes was a member of the American Medical Association, the Hennepin County Medical Society, and the Minnesota State Medical Association. He served as city physician in Minneapolis for many years. He was a lifelong resident of Hennepin county, having been born there in 1867.

He is survived by one sister, Mrs. Sarah Mudrean, and a brother, Frank Hynes, both of Minneapolis.

Dr. John L. Montgomery

(1890-1932)

Dr. John L. Montgomery, formerly of Minneapolis and in recent years a resident of Long Beach and Los Angeles, California, died at Rochester, Minnesota, Tuesday, July 5, 1932, following an illness of fifteen days.

Dr. Montgomery was born in Wisconsin in 1890. His medical training was received at Bennett Medical College, Chicago, where he received his degree of M.D. in 1911. Dr. Montgomery came to Minneapolis in 1914 and practiced there intermittently until 1930, when he moved to California.

Dr. Herman Russell

(1871-1932)

Dr. Herman Russell died Wednesday, June 29, 1932, in St. Luke's hospital, Saint Paul, following an extended illness. He was sixty years old and had practiced medicine in Minnesota for thirty years, being associated with the Mayo brothers in Rochester prior to practicing in Saint Paul. He is survived by his widow, Mrs. Martha Russell; a son, Owen, and a daughter, Mrs. John Lindemann, both of Minneapolis, and his mother, Mrs. Charles Russell of Saint Paul.

REPORTS AND ANNOUNCEMENTS *of* SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of August will be as follows:

August 3—Signs of Heart Disease.
August 10—Poison Ivy.
August 17—Getting Ready for School.
August 24—Pyelitis in Children.
August 31—Ulcer and Cancer of the Stomach.

McLEOD COUNTY SOCIETY

At the recent annual meeting of the McLeod County Medical Society Dr. O. W. Scholpp, Hutchinson, was lected president and Dr. W. W. Klima, Stewart, was lected secretary-treasurer.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association will meet in Crookston this year on September 19 and 20. Plans are being made for an interesting program, which is being arranged by the Program Committee, onsisting of Dr. A. C. Baker, Fergus Falls, Chairman; Dr. F. J. Hirschboeck, Duluth; Dr. J. M. Hayes, Minneapolis, and Dr. O. O. Larsen, Detroit Lakes.

AMERICAN PUBLIC HEALTH ASSOCIATION

The sixty-first annual meeting of the American Pub-ic Health Association will be held this year in Wash-ngton, D. C., October 24 to 27, with headquarters at he Willard Hotel.

In connection with the meeting of this association, which includes all public health workers, there will be meetings of the American Social Hygiene Association, he American Association of School Physicians, the In-ernational Society of Medical Health Officers, the Conference of State Laboratory Directors, the Conference of State Sanitary Engineers, and the Association of Women in Public Health.

Among the subjects which will be discussed are: mental hygiene, training of engineers, nurses and health officers, diphtheria, air hygiene, bacterial carriers, vital statistics, registration problems.

AMERICAN CONGRESS OF PHYSICAL THERAPY

Announcement is made of the Eleventh Annual Scientific Session of the American Congress of Physical Therapy, which, this year, will be held in New York City. The Hotel New Yorker, with its excellent convention facilities, will be the official headquarters. The convention will be conducted over the week from September 5 to 10, but, officially, the scientific sessions will be run on September 6, 7, 8, and 9. On September 10, Clinics will be given at more than fifteen New York Hospitals.

The preliminary program which has been arranged definitely marks the 1932 session of the Congress as the year's outstanding event in physical therapy. The leading teachers, clinicians and research workers in the field have accepted invitations, and will contribute valuable scientific information to this year's Congress.

Added features in connection with this year's program are the new sections on stomatology and colon therapy. The demand for authentic instruction in these respective specialties has prompted the program committee to ask for scientific contributions from prominent clinicians. The response has been unusual, permitting the organization of a full day's program in each section.

The sections on Medicine, Surgery, and Eye, Ear, Nose and Throat will, as heretofore, include their various group and allied specialties. Cancer, tuberculosis, and arthritis are favorite subjects which will be discussed in interesting symposia. The subject of electrosurgery of tonsils will be adequately dealt with by prominent laryngologists in the eye, ear, nose and throat section.

The outstanding achievement in physical therapeutics, the production of artificial fever by diathermy and its use in various chronic diseases, will occupy a special place on the program. Representative workers are prepared to present available data of their accomplishments with this newer therapeutic agent.

The Congress meets in the East for the first time in its eleven years of existence. This is the result of numerous invitations which have come from Eastern leaders engaged in the physical therapy science. From present indications this convention should attract the largest attendance in the history of the Congress. Preliminary programs may be secured by addressing the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

MINNESOTA RADIOLOGICAL SOCIETY

The annual meeting of the Minnesota Radiological Society was held in Saint Paul on May 22, 1932.

Officers for the coming year were elected as follows: President, Dr. Gage Clement, Duluth, Minn.; Vice President, Dr. Edward Schons, St. Paul, Minn.; Secretary-Treasurer, Dr. Leo G. Rigler, Minneapolis.

The following scientific program was presented:

1. Intravenous Urography as an Aid in Diagnosis—Dr. G. T. Nordin, Minneapolis.
2. X-ray Treatment of Inoperable Carcinoma of the Breast—Dr. Eugene T. Leddy, Rochester, Minn.
3. Round Table Discussion of Cases for Diagnosis—Conducted by Dr. J. R. Aurelius, St. Paul.
4. Clinical-Radiological Conference, Diseases of the Chest—Dr. B. R. Kirklin, Rochester, Minn.
5. Clinical-Radiological Conference, Diseases of the Stomach—Dr. Leo G. Rigler, Minneapolis, Minn.

WABASHA COUNTY SOCIETY

The sixty-fourth annual meeting of the Wabasha County Medical Society was held at Plainview on Thursday, July 7, 1932.

The following papers were presented:

President's Address—"Some Changes in Thirty-eight Years"—W. F. Wilson, M.D., Lake City

"New Developments in the Diagnosis and Treatment of Gastric Cancer and Ulcer" (Illustrated by lantern slides)—G. B. Eusterman, M.D., Mayo Clinic, Rochester

"Osteomyelitis of Humerus Treated with Maggots"—R. C. Radabaugh, M.D., Hastings

"Peroral Endoscopy"—D. G. Gardiner, M.D., St. Paul

"Simplified Infant Feeding"—Thomas Myers, M.D., St. Paul

There were twenty-five in attendance, including nine ladies accompanying the physicians.

The following officers were elected for the coming year: President, Dr. W. B. Stryker, Plainview; vice president, Dr. R. C. Radabaugh, Hastings; secretary-treasurer, Dr. W. F. Wilson, Lake City; delegate to State Association, Dr. R. H. Forst, Wabasha; alternate, Dr. D. S. Fleischhauer, Wabasha.

Dr. J. F. Bond, Wabasha, was elected censor for three years. The other censors are Dr. J. A. Slocumb, Plainview, and Dr. W. J. Cochrane, Lake City.

It was voted to hold the next annual meeting at Wabasha in July, 1933.

A resolution was adopted providing for reciprocal relations between the Winona and Wabasha County Medical Societies, and calling for one or more joint scientific and social meetings to be held during the year, alternately in each county, specific arrangements for the same to be made by the two secretaries.

A vote of thanks was extended, especially, to the Plainview doctors for their generous hospitality, and to the guest speakers for their instructive talks.

Dr. W. F. Wilson, *Secretary-elect.*

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of May 18, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 18, having been postponed one week on account of the A. M. A. meeting. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were fifty-six members and two visitors present.

Minutes of the April meeting were read and approved.

The scientific program consisted of the following:

Dr. H. E. Michelson (Minneapolis) presented a little girl with xeroderma pigmentosum.

Xeroderma pigmentosum was first described by Kaposi. Since then cases have been reported from almost every country. The condition is definitely due to a sensitivity to the sun's rays. After the first exposure to the sun's rays, usually in the first spring of a child's life, a very severe erythema develops. This is followed by a profuse freckle formation and a degree of dermatitis. Some of the freckles become keratotic and gradually warts develop, which eventually become epitheliomas. In the well-developed case there is to be noted pigmentation, atrophy, telangiectasia, verrucæ, and epitheliomas. The prognosis is not good. The epitheliomatous condition causes the exitus.

DISCUSSION

Dr. E. M. Hammes (St. Paul): If that youngster were kept in the house all the time and out of the sun's rays, would these lesions form?

Dr. Michelson: She would have to be kept almost in the dark to avoid enough rays to prevent the condition from progressing.

Dr. F. E. B. Foley (St. Paul) presented the new Foley prostatic excisor which he has made.

Dr. O. H. Wangensteen (Minneapolis, U. of M.) read his Inaugural Thesis entitled "Therapeutic Considerations in the Management of Acute Intestinal Obstruction," of which the following is an abstract.

From a pathological point of view there are two kinds of intestinal obstructions, viz., simple and strangulation varieties. In the one there is obstruction of the continuity of the bowel only; the other presents, in addition, vitiation of its blood supply. In many potential strangulation obstructions such as encirclement of the bowel by adhesive bands, intussusception and volvulus, the time factor is a significant item in determining whether the treatment will be that of simple obstruction or of late strangulation in which non-viable bowel must be excised. All strangulation types of obstruction with the single exception of primary thrombosis or embolism of the mesenteric vessels may, when dealt with early surgically, on release of the constricting mechanism be managed as instances of simple obstruction.

Distention, with attendant loss of vital fluids by vomiting, and interference with absorption from the bowel, is the commanding factor demanding attention in simple obstruction. Decompression of the distended bowel in such instances is life-saving, not because it drains off a potent toxin that threatens the organism, but because it relieves tension and allows of continuance of normal absorption. There is no concrete evidence that indicates that there is abnormal absorption from a viable bowel, though there is considerable proof to the contrary. A strangulation infarcted bowel presents, in addition to obstruction to its continuity, the item of blood loss or hemorrhage into the strangulated segment.

Early diagnosis is of extreme importance in the successful management of all acute abdominal disasters. A large number of instances of bowel obstructions are recognized rather late in their course. No colic of the abdomen, however, is more easily identified than that of the intestine. In a patient complaining of intermittent crampy, colicky pain, attended by nausea and vomiting, the audition with the stethoscope of loud intestinal borborygmi synchronous with the acme of the pain establishes the presence of *intestinal colic*. It only remains, then, to determine whether the colic is due to mechanical bowel obstruction, enterocolitis, food-poisoning, or to simple "belly-ache." This differential is usually made with ease on the general symptoms present, such as vomiting, diarrhea, malaise, fever, and tenderness. Accompanying intestinal stasis there is always accumulation of gas in the small intestine, where it is normally not visible in the roentgen film of the adult's abdomen. Visible gas in the small intestine of the adult is synonymous therefore with intestinal stasis. The *stethoscope* determines whether the obstruction is mechanical or adynamic in character.

There are four factors that are commonly observed to contribute to delay in the early recognition of acute intestinal obstruction: (1) failure to appreciate that obstruction of the bowel is not accompanied by tenderness or rigidity of the abdominal wall (strangulation types of obstruction, however, with the exception of intussusception regularly exhibit local tenderness); (2) belief that the expulsion of gas or feces with an administered enema militates against bowel obstruction; (3) assuaging pain with morphin; (4) the deception of apparently effectual catharsis in partial obstruction.

The remedial agents in the management of acute intestinal obstruction are: (1) saline; (2) transfusion; (3) decompression by nasal catheter suction siphonage; (4) operation.

The keynote of successful therapy of acute intestinal obstruction is early release of the obstruction. In the majority of the clinical varieties of bowel obstruction, recourse is to be had to surgical measures of relief.

Saline exhibits the virtues of a specific only in the high obstructions in the first part of the intestine beyond the pyloric outlet, not as an antidote for the neutralization of an absorbed toxin, but rather as a satisfactory substitute for fluids lost by vomiting. The blood chemistry alterations that attend "high" obstructions in the experimental animal may be obviated by the subcutaneous or intravenous administration of saline, and the animal's life prolonged for three to four weeks following complete duodenal obstructions by this means alone. In low obstructions, however, saline is of no special value and does not prolong the life of the experimental animal, neither do the blood chemistry alterations regularly obtain. Too much emphasis has been placed on the value of saline in the treatment of bowel obstruction. Decompression is the most significant item in effective therapy, and very few patients can be prepared for operation in acute bowel obstruction by temporization with saline. During the hour following diagnosis, when preparations are being made for operation, saline is to be freely administered, 3,000 to 4,000 c.c. being given by the subcutaneous and intravenous routes.

In strangulation obstructions the blood loss factor may be significant. In instances of intussusception, volvulus or adhesion torsion of the bowel, considerable blood may be lost into the infarcted segment, and blood replacement by transfusion is a great boon to such patients.

A large number of instances of simple obstruction may be satisfactorily decompressed by nasal catheter suction siphonage. Adhesive bowel obstruction is especially amenable to treatment by this method, whether the causative adhesive obstructing mechanism is of recent (postoperative) or remote origin. Of twelve patients with acute simple obstruction of the small intestine treated at the University Hospital since August, 1931, nine have been satisfactorily decompressed by nasal catheter suction siphonage alone. In the remaining three, enterostomy was done because of the continued persistence of the obstructing mechanism. The rationale of the method lies in the fact that the chief source of gas in the intestine is swallowed air. Just as the evacuation of the bowel incident to the indirect attack of enterostomy upon the obstruction usually permits the continuity of the intestinal current to be reëstablished automatically, so drainage from the upper end of the intestinal canal may achieve the same end. The advantage that enterostomy presents over nasal catheter drainage is that feeding may be continued because the drain, in accordance with the logic of good plumbing, is near the obstruction. In the employment of this method it is essential to follow the decompression fairly frequently by X-ray films to be certain that the distention of the intestine is being accomplished, for the patient usually becomes free from pain incident to the stopping of accretion in intestinal distention with the institution of suction. When the distention of the bowel is reduced and gas makes its way into the colon, one knows that the obstructing mechanism has righted itself.

The method is also of value (and was first used in acute mechanical obstructions by the writer to improve the condition of a late case of low intestinal obstruction for operation) in preparing patients with considerable distention for operation in which the cause of the obstruction continues to operate, *e.g.*, stricture of the bowel. It has been employed also in a fairly large number of subacute and chronic obstructions to tide the patient over into a non-obstructive phase in which he may then be operated upon, if necessary.

Nasal catheter decompression is not to be attempted in mechanical obstructions in the left colon where the distention is limited by a competent proximal ileocecal sphincter (as shown by the X-ray film) to the colon alone. In strangulation obstructions, also, immediate resort is to be had to surgery.

The most important task the surgeon has to decide when operating for acute intestinal obstruction is the choice of procedure. When dealing with simple obstruction he should permit himself to be guided by the patient's condition. In early instances he may do the operation of election, viz., locate the obstruction, determine its nature and establish the continuity of the bowel. In late cases of simple obstruction he should do the operation of necessity, viz., enterostomy. An *aseptic* enterostomy done without spillage, employing a small catheter (14 F) and performed so that it will not leak, may be done in even the late cases with very little risk, and will invariably close itself when the obstructing mechanism below ceases to operate. In strangulation obstructions, the question that must be determined is, "Is the bowel viable?" If not, no matter what the condition of the patient is, the non-viable bowel must be excised. In the majority of instances, it is far safer to exteriorize the devitalized segment and to reëstablish the continuity of the bowel by a secondary anastomosis than to do a primary resection with anastomosis.

DISCUSSION

Dr. J. A. Johnson (Minneapolis): I have enjoyed Dr. Wangensteen's presentation very much. There are only two points I wish to stress. For the past ten years I have been using the Rehfuss tube for gastric drainage where there has been postoperative ileus present. This has been very satisfactory. I am sure, however, that attaching the continuous suction apparatus and putting the tube through the nose is not only more comfortable for the patient but more efficient. Dr. Wangensteen mentioned that an enterostomy had the advantage of being able to feed the patient through the opening. I have had instances where I have allowed the Rehfuss tube to pass down into the duodenum and give duodenal feedings. This has been very satisfactory in several cases.

The other point I wish to make is that an enterostomy is of no value in paralytic ileus. The only way that the bowel can be drained efficiently is by its peristaltic movement. When there is no peristalsis, the only part that will be drained is the immediate loop in which the enterostomy is inserted.

Dr. Wangensteen (in closing): It is very refreshing to note this interest in the subject of bowel obstruction. There is one comment I should like to make with reference to the contractility of a dilated bowel, which Dr. Johnson mentioned. He undoubtedly had reference to the distended bowel of inhibitive or so-called paralytic ileus, which distention we all know is extremely difficult to deal with therapeutically. However, now and then one hears implied or frankly stated that patients with acute mechanical obstruction fail to get well, despite late attempts at reduction of the distention, because the bowel had been dilated so much and so long that its inherent power of contractility was gone. I am inclined to doubt such an explanation. All hollow viscera have a great capacity for accommodating themselves to various grades of distention. Unless the circular muscle of the bowel be torn, I rather suspect if a means for emptying the bowel (enterostomy or other decompressive measure) is provided, that its contents will be evacuated. It is undoubtedly true that the peristaltic activity of such a bowel is reduced, but I have been impressed to note at operation how an obstructed small intestine with a paper-thin wall, and so dilated that it takes two fairly long rubber-covered stomach clamps to extend across the transverse axis of the bowel for purposes of isolating a loop that can be entirely evacuated to permit of an aseptic enterostomy, will contract down immediately following aspiration of its content.

My experience with conservative decompressive measures in the treatment of peritonitis has been much the same as that related by Dr. Zimmermann. Nasal catheter suction drainage contributes very materially to the comfort of these patients and makes their convalescence easier. I am not agreed with him, however, that ileus or distention is the most significant item in determining whether recovery from peritonitis will occur. It is my impression that persons dying of peritonitis succumb to their peritoneal infection and not to absorption from the bowel. Much has been written about the present improved results in the treatment of peritonitis over those obtained by our predecessors who were pioneers in abdominal surgery. It is true we have gone far in refinements of diagnosis and surgical technic that contribute to better results. When one considers postoperative peritonitis, however, into the treatment of which these refinements do not enter, he finds that the mortality is just as great as it was forty years ago. Professor Nordmann of the Augusta-Viktoria Krankenhaus of Berlin, in presenting the results of such a study before the German Surgical Congress a few years ago, stated that, whereas the results in appendiceal peritonitis were much improved, there was yet no manifest improvement in postoperative peritonitis.

Dr. Litzenberg and his staff at the University Hospital have occasionally called us in to try to do something for the distention not uncommonly attending the sepsis of parametritis and peritonitis following induced abortions. The distention that such patients exhibit is usually refractory to the ordinary means which one employs in dealing with postoperative distention. In past years, I have done a few enterostomies for this condition, but have always been chagrined to see how promptly such patients die, when it seemed that if the distention could be adequately dealt with, the patient might continue on with at least a ray of hope for some time. The gentlest intraperitoneal manipulation in such cases helps to disseminate the infection. Within the past year, Dr. Litzenberg's department referred us two more patients, both of whom were dealt with by nasal catheter suction siphonage alone. One of these was a comparatively young woman with a spontaneous intraperitoneal perforation of a carcinoma of the cervix. She was enormously distended. By employing a combination of nasal and rectal suction we were able to deal satisfactorily with the distention. The patient improved, felt better, and took food again, but despite effectual decompression, after temporary improvement she died of her peritonitis.

Though we have gone far in the treatment of local infections of one sort or another, we are almost as helpless today in the treatment of generalized infections as we were in the pre-antiseptic period. There are no known agents that will aid your patient with a bacteremia. The patient must fight out the struggle himself.

Dr. J. C. Litzenberg (Minneapolis): If the Chairman may be permitted a word, I wish to say that while in New Orleans I went one day to the scientific exhibits, and got into just one. That one showed work along the line of Dr. Wangensteen's thesis by Ochsner, which he has as yet not published. It will pay you to watch for its publication for I am sure you will find the work unusually interesting after hearing the thesis of Dr. Wangensteen tonight.

Dr. J. A. Johnson (Minneapolis) reported a case of Meckel's Diverticulum Causing Intestinal Obstruction.

Master C. J., aged thirteen, was brought to Northwestern Hospital on August 30, 1925, with an acute abdominal condition. The past history was negative except that he had had an operation for acute appendicitis on February 7, 1924.

The present trouble began two days previous to his admission to the hospital. He was suddenly seized with a severe pain which was referred to the navel. This was soon followed by vomiting. He was given cathartics and enemas without any result. The following day his family physician was called and an attempt was again made to relieve his condition with enemas. No result was obtained and he was, therefore, taken to the hospital for operation.

On examination of the abdomen it was found to be very distended and rigid; peristalsis was very active, and he was vomiting repeatedly. His pulse was 132, temperature 99°, and W.B.C. 17,500. The urine was negative.

At operation a Meckel's diverticulum was found located about 20 inches from the ileocecal valve. There was a firm fibrous band from near the tip of the diverticulum, attached to the navel. Several loops of the ileum had become twisted about this band and were obstructed. The diverticulum had perforated near its base and the abdomen was filled with thin, slightly purulent fluid. The band was detached, the diverticulum removed, the purulent fluid aspirated from the abdomen, and a penrose drain placed in the pelvis. There was considerable drainage for 48 hours. At the end of five days the drain was removed and the convalescence was uneventful. He left the hospital on the 17th postoperative day.

In August, 1923, I published in Minnesota Medicine an article discussing Meckel's diverticulum as an etiological factor in intestinal obstruction, with a report of three personal cases. The literature was carefully reviewed at that time and it was evident that nearly 2 per cent of all mechanical obstructions could be attributed to Meckel's diverticulum. This is my fourth personal case and it seems that Meckel's diverticulum is important enough so that we should keep it constantly in mind. Many authors state that its potential possibilities for trouble are even greater than the appendix.

My reason for reporting this case is to again call this condition to your attention. (Lantern slides were shown.)

Dr. A. E. Wilcox (Minneapolis) reported a case of Perforation of Meckel's Diverticulum by a Fishbone.

The patient, W. F., was a made, aged seventy-one. He gave a previous history of a gastroenterostomy for relief of duodenal ulcer in 1909; excision of the gastric ulcer in 1925; and he was then apparently well, except a postoperative hernia, until his present illness.

On April 8, 1932, he developed pain in the lower abdomen which was not sharply localized, some nausea, but no vomiting. The following morning the pain was more severe, intermittent and the attacks more frequent. Diarrhea was a rather marked feature. He was examined by his physician forty-eight hours after the original pain and, suspecting appendiceal involvement, the patient was admitted to Abbott Hospital about noon, at which time his white blood count was 13,600, temperature 98.4°, pulse 78, and respiration 18. A diagnosis at 5:30 p. m. was probable appendicitis, and exploration advised. The patient was not entirely convinced of the necessity of operation and requested further consultation and observation. At a 6:30 p. m. consultation, the pain seemed to have moved up to a higher position, a little to the right of the midline. There was some resistance in the right rectus muscle.

At 9 p. m., April 10, the pain was again more marked in the right lower quadrant, with definitely increased muscular rigidity, and the consultants agreed on a diagnosis of appendicitis either simple or combined with other pathology of the colon, the nature of which was unknown, and operation was advised.

On April 10, at 11 p. m., operation was done under spinal anesthesia preceded by H.M.C. No. 1. The abdomen was opened through a right rectus incision immediately below the postoperative hernia. No free fluid was noted upon opening the peritoneum. The appendix was easily exposed and appeared innocent; it was, however, removed. The colon was then investigated as high as the hepatic flexure and found negative with the exception of extensive adhesions resulting from previous operations. The ileum was about to be examined when the patient strained (otherwise the spinal anesthesia was satisfactory), and a loop of ileum presented in the operative field, exhibiting a small broad-based Meckel's diverticulum, the apex or greater convexity of which was whitened, and through this area a fishbone protruded into the free peritoneal cavity to the extent of one-quarter of an inch. The pathological problem having been solved, the fishbone was removed and the perforation with surrounding necrotic area invaginated with a purse-string suture of dulox, reinforced with Lambert sutures of the same material. No further surgical procedure seemed indicated and the abdomen was closed without drainage. Convalescence was not markedly stormy; there was a rise of temperature on the second day to 102.4°, leukocytes 23,875, lungs negative, and a progressive decline of temperature to normal on the fourth day was followed by no marked difficulties and the patient rapidly recovered, leaving the hospital on the ninth postoperative day.

DISCUSSION

Dr. Martin Nordland (Minneapolis): In this connection, I would like to report a case I had three years ago. This young woman, as in the other cases of Meckel's diverticulum, came into the hospital with a diagnosis of acute appendicitis. A mass was felt in the lower right quadrant, by both abdominal and bimanual examinations. She had a low leukocyte count, however. She had a history of a previous abortion, and it was thought this mass might be an enlarged tube. It proved to be a case of Meckel's diverticulum. The diverticulum was invaginated into the ileum from its origin about eighteen inches above the valve and, puckering the distal ileum, came down to and through the ileocecal valve.

It has been stated that Meckel's diverticulum exists in about 2 per cent of all people and, according to Halstead, causes about 4 per cent of the obstructions of the bowel.

The meeting adjourned.

R. T. LaVake, M.D., *Secretary.*

PROCEEDINGS MINNEAPOLIS SURGICAL SOCIETY

Meeting held May 5, 1932

The President, Dr. J. F. Corbett, in the chair

Dr. Gilbert Cottam read his Inaugural Thesis on "Pulmonary Embolism." Lantern slides were shown. (To be published separately.)

DISCUSSION

Dr. E. K. Green said he would like to report a case which he operated within the last month for a large ovarian cyst. The patient was 46 years of age, in very good health, but had called a doctor because of a severe pain in the region of the right kidney and gallbladder. The large cyst was discovered and she was sent to the hospital. For three nights prior to the operation, in which she was under observation, she had attacks of pain, usually mild but once quite severe, cutting off her breath and running up into the right side of her neck. Angina was considered one of the possible causes of the pain, but the operation seemed important and was performed. She made an uncomplicated recovery, with only slight temperature for three or four days following the operation. On the ninth postoperative day she seemed exceptionally well when Dr. Green made rounds. About two hours later he was called hurriedly, and reached the hospital in a few minutes to find her in extreme danger with apparent cardiac embarrassment. She died in about twenty minutes.

The postmortem showed a decided calcareous thickening and narrowing of the left coronary though it was not entirely occluded. She had a pulmonary embolus, though the part of the lung involved was comparatively small. This case seemed to Dr. Green rather unique with both conditions present. He also had wondered if she might not have recovered from the embolus if the heart had been perfectly normal.

Dr. J. A. Johnson thought that probably many of the members felt as he did about this—that one did not really know much about the subject. He had been unable to explain why emboli occurred, and referred to them as the "lightning of surgery." Possibly some type of low-grade infection had something to do with their formation. From the clinical standpoint, one usually finds there is a low-grade temperature, 99.2° or 99.4°, and the embolus usually occurs about the 10th to 14th day. From several years of observation Dr. Johnson had noticed that in certain years they are more frequent than in other years, although he could not explain why. About two years ago there were a lot of cases in the city; then some years even when they are doing quite a lot of surgery there will be almost no emboli cases in the hospital.

The operation which Dr. Cottam described is not especially a difficult one and Dr. Johnson said he had performed it on two postmortem cases. He stated that he had his instruments all boiled up so that if anything happens like that he will be all ready for it. Fortunately nothing had happened in which he would have occasion to use them. He was of the opinion that one could not expect much from the operation; and it should be used only as a last resort, as a possible lifesaving measure; and of course all surgeons hope they will not have to do it.

Dr. L. H. Fowler said he might report one patient whom he and Dr. Wm. A. Hanson had operated upon in 1927. This patient was a woman about 40 years of age, upon whom they had performed a posterior gastroenterostomy and appendectomy for a subacute duodenal ulcer. She had an absolutely normal convalescence until the 10th postoperative day. Dr. Fowler said he was standing by her bed on that morning and had just told the patient she could sit up, when she suddenly was seized with severe agonizing pain behind the sternum and in the right lower chest. An anxious expression appeared on her face and her pulse became very rapid and weak and within a few minutes she became pulseless and cold, and had every appearance of a patient who was dying from a large pulmonary embolus. She was given morphin and oxygen and kept under constant observation by one of them for the next twelve hours. Her condition gradually improved after the first two to three hours and she made a good recovery. She later developed definite evidence of phlebitis in the left leg.

This was a case with all the indications for an immediate embolectomy such as Dr. Cottam has described, were the surgeon prepared to perform the same, but illustrates the fact that occasionally a patient will recover from such a great surgical disaster without the added risk of embolectomy.

Dr. Theodore Sweetser cited two cases wherein recovery from postoperative pulmonary embolism occurred without surgical treatment in spite of very alarming symptoms at the time of the accident. He also called attention to the prophylaxis suggested before the Society last year by Dr. Clay Ray Murray, *i.e.*, routine determination of the coagulation index of the blood postoperatively, and the use of sodium citrate solution intravenously when indicated. He asked whether any of the members were using that plan.

Dr. O. J. Campbell said he had an opportunity, in 1925, to see a number of cases at St. Mary's Hospital in Rochester. One particular case was recalled, that of a surgeon who had several severe pulmonary emboli from which he eventually recovered. Having a full knowledge of the condition, the patient was able to testify accurately to the relief afforded by the use of large doses of morphin. The objective symptoms were likewise relieved. Though it might seem contraindicated, morphin is actually of great value in cases not immediately fatal.

Dr. Wm. A. Hanson stated that all the members have been interested in pulmonary embolism, more especially after having cases of their own. Many men have postulated theories as to the cause and the treatment. However, preoperative and postoperative care are the most essential. Dr. R. C. Coffey, and especially his son, Dr. J. C. Coffey, have contributed materially to knowledge of the treatment. Dr. J. C. Coffey found that giving thyroid extract postoperatively to patients with the idea of increasing their metabolism, thereby increasing their circulation with frequent deep inspirations, changing their posture and especially early movements of their lower extremities as well as having the patients inflate small balloons, reduced the complication of pulmonary embolism materially. Pulmonary embolism is very rare in postoperative thyroidectomies in either toxic or non-toxic types.

Dr. John H. Rishmiller reported the following case of Riedel's Struma.

The patient, Mr. R., aged fifty-eight, was first seen April 9, 1927. He had had hay fever and asthma up to eight years ago and this recurred again the previous October and lasted one month. Three years ago he developed hoarseness which lasted two or three days at a time. There was no soreness but he had phlegm in his throat which he could not loosen during the hoarseness. He had no difficulty in breathing when he had this hoarseness.

The examination revealed the neck slightly enlarged but there appeared to be no enlargement of the thyroid behind the sternum. On palpation, both thyroid glands were densely hard, about equal in size, and slightly enlarged. By pressing on one thyroid the impact was transmitted to the other gland. Apparently the thyroid glands were undergoing adenomatous degeneration.

The patient complained of difficulty in swallowing, which he relieved by grasping firmly the skin over the larynx and pulling the thyroid and trachea away from the esophagus. He constantly complained of difficulty in breathing, on account of the density of the isthmus which connects both lobes in horseshoe fashion and straddles the trachea.

Last week the patient had had chills which were due to influenza infection (or to some infection) lasting a few days. (The patient thought the chills might be due to the thyroids but that is impossible without infection.)

His heart and lungs were normal. The blood pressure was 120/80. He had ten lower teeth, one of which was filled, and eleven upper teeth, three of which were inlayed. His tonsils were small. While the patient was standing his pulse was 108, and while sitting it was 86. The urine showed a specific gravity of 1022, and was normal.

A metabolism test was advised in about two weeks, or after the system was in normal condition from the influenza infection; also an X-ray examination of the trachea.

At the examination of April 20, the patient thought he had lost about 24 pounds since February 22. His weight at the Swedish Hospital when the metabolic test was made by Dr. Drake was 148 pounds. (The basal metabolism showed 62 plus on April 19.) His temperature was 98.6°. While the patient was on the examining table his pulse was 100 to 102, and while he was sitting up it was 104 to 106. His blood pressure was 120/80, and 136/80. With the patient relaxed horizontally on the examining table, both thyroid lobes were found to be firmly connected by the isthmus, as pushing on one lobe pushed out the other and pressing down on one thyroid elevated the other. The left lobe was deeper laterally but neither lobe extendd downward into the chest.

On April 23 Lugol's solution was prescribed, seven drops three times a day.

On May 1 the patient entered Eitel Hospital for preoperative rest to the cardiovascular system. The operation was performed on May 9, 1927, under gas anesthesia, Dr. A. L. Herman assisting. After iodin and alcohol preparation, a Kocher's low collar incision was made through the skin and platysma and a flap was dissected upward to the hyoid bone. The right anterior jugular vein was in evidence but not the left, although there was a large vein on the left deeper in, which was not likely the anterior jugular. The bleeding points were caught and ligated. A central fascial incision was made, separating the right and left short neck muscles.

On the *right* side the muscle compartment over the right thyroid was opened and the muscles separated from the goiter; the external capsule was incised and pushed to either side, thus exposing the densely indurated lobe. The superior thyroid artery and vein were separated from adjacent tissues and ligated twice with ten-day chromic catgut, and severed close to the goiter. Heavy hemostats were placed on the side of the goiter and incision made in front of the clamps toward the trachea, thus more safely evading the recurrent laryngeal.

On the *left* side the isthmus was dissected from the lower border of the trachea, the muscle compartment was opened and the goiter separated. The external fascia was incised; this was very filmy, but an effort was made to separate as much as possible from the densely indurated gland. The superior thyroid artery and vein were freely dissected, ligated twice and severed, including some goiter tissue. Hemostats were applied on the outside of the goiter and incision made in front of the clamps toward the trachea. The gland tissue was removed *en bloc*—right and left lobe with the isthmus.

All bleeding points which had been caught with hemostats were ligated with fine ordinary catgut. The patient was then permitted to come out of the anesthesia sufficiently to produce retching but not vomiting, which started a few oozing points on the left side of the trachea. These were caught with hemostats and ligated. The operative field was entirely dry. The sternothyroideus and sternohyoideus muscles were united with 10-day chromic catgut blanket sutures, leaving a rubber drain with gauze inserted in the lower end of the wound down to the trachea. The platysma was united with ordinary catgut blanket suture. The skin was united with Meckel clips, eight on the right and ten on the left. Gauze was applied above and below the Meckel clips, and a bulky gauze dressing was applied and held in place with crosswise adhesive plaster.

The patient's condition was excellent. His pulse was around 100. He was given M.S. gr. 1/6 and atropin gr. 1/150 when necessary to control nervousness and irritable coughing, receiving in all three hypodermics.

Macroscopically the specimen was of cork-like consistency, with a few dense nodules in the center, and appeared as though there might be sclerosis of the parenchyma. It was so densely indurated that it was practically impossible to apply forceps for traction or for grasping the bleeding points. A question arose as to its being carcinoma but the high metabolic rate—plus 62—is against such supposition.

On May 10, the patient was catheterized at 8 a. m. His pulse was 112, temperature normal, and condition excellent. On May 11 every alternate Meckel clip was removed, and the rubber and gauze drain removed.

Pathologist's report (Dr. W. A. O'Brien) gave the diagnosis as "Riedel's Struma."

On May 21 the pulse for past three days was about 80, coming down gradually from day to day, starting several days after operation. The patient left the hospital for his home.

At the time of this meeting (May 5, 1932) the patient has not been under the care of a physician for some time and is perfectly well.

Dr. Martin Nordlund reported the following case of Riedel's Struma:

The patient was a woman, age fifty-eight, whose marital history is negative. The patient stated that she had had a chronic cough and eight years ago was treated for pulmonary tuberculosis, being under active observation for more than a year; otherwise her past history is not important.

For the present complaint, the patient comes with a typical symptom-complex of myxedema which has been coming on gradually for a period of 18 months. The characteristic pallor and puffiness of the tissues, with labored speech, and extreme exhaustion, were markedly developed. This was attended by gradually increasing dyspnea, stridor, and hoarseness. During this period she had noticed a gradual enlargement of her neck, together with a tenderness on pressure.

Examination of the thyroid gland revealed a very hard, tense, and somewhat nodular swelling of both lobes. The basal metabolic rate was minus 34. Because of the age of the patient and the recent loss of about 26 pounds in weight, a tentative diagnosis of "carcinoma of the thyroid" was made.

At operation the thyroid was white, hard and densely adherent to the surrounding structures. Both lobes and isthmus were removed. Microscopic examination showed extensive fibrosis without any evidence of normal thyroid tissue. The patient made an excellent recovery without injury to the voice and without tetany. The compression of the trachea was relieved and the myxedema has been controlled by thyroid substance. The basal metabolic rate since the operation has varied rom minus 3 to plus 7, with administration of thyroid xtract.

Operative treatment in thyroiditis is usually limited to xcision of the isthmus, leaving the lateral lobes for upport to the trachea. Radical removal was considred justifiable in this case because the mass was so suggestive of malignancy and because repeated experience has shown that interpretation of the microscopic appearance of tissue removed at biopsy may be very difficult even to the skilled pathologist,

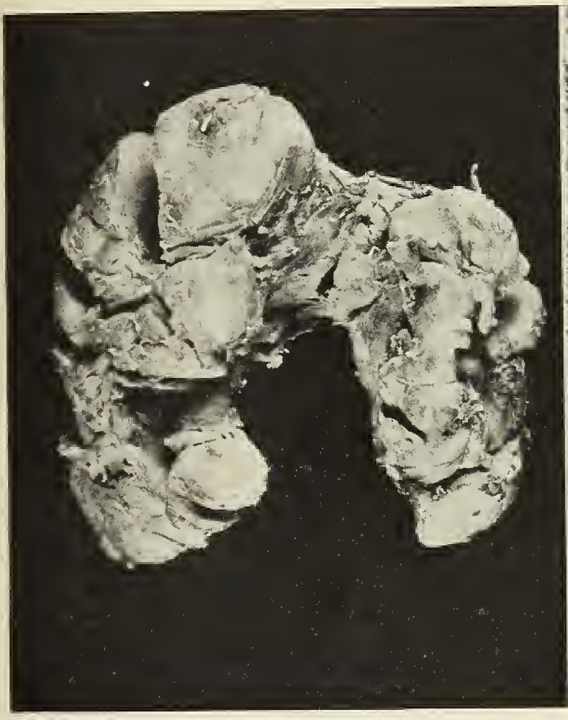

Fig. 1. Gross specimen of woody thyroid.

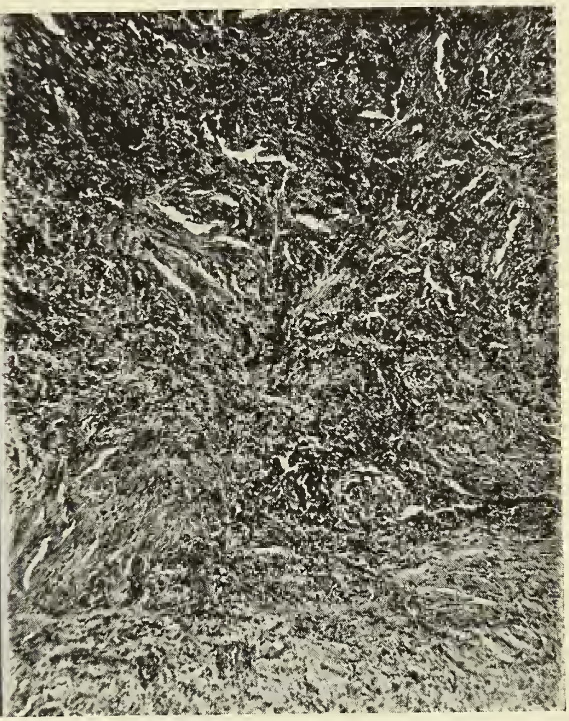

Fig. 2. Microscopic view of woody thyroid. Note extreme fibrosis and total absence of functioning tissue.

Because of the difficulty in diagnosis between a malignant goiter and certain forms of long-standing thyroiditis, Dr. Nordland said he thought it might be of interest to report this case, showing the specimen and calling attention to a few of the points in differential diagnosis between this and carcinoma.

Woody thyroiditis, also called "ligneous goiter" and "Riedel's disease," is a rare but important form of chronic inflammation of the thyroid gland. It is of importance because of its liability to be mistaken for carcinoma. In 1896, Riedel published a description of two cases of a condition to which he gave the name of "Eisenharte Strimitis," and, in subsequent years, observation of a similar nature was recorded by the same writer and by others, bringing the total number of published cases up to 17. Boyd, in his text on Pathology published in 1925, had seen only one case.

More than one-half of the recorded cases have been in men. The more common age is in the fourth decade.

A distinctive feature is the rapid evolution of the disease. In a few months a tumor develops which produces serious effects by compression of the trachea and the recurrent laryngeal nerves, this being accompanied by dangerous paroxysms of dyspnea as exhibited in this case. It is rare to find evidence of pressure on the sympathetic nerves or upon the esophagus.

At operation the gland presents a remarkable appearance. The enlargement is uniform and involves the whole gland. The surface is smooth, white in color, and the limits are poorly defined. The gland is extraordinarily hard, merging with the surrounding tissues. There is no change in the surrounding lymph glands. The specimen has the appearance of having been preserved in formalin before it reaches the laboratory. It is hard to cut.

Microscopically it consists of dense, sclerotic tissue in which only remnants of glandular tissue remain. In the specimen in this case, no evidence of functioning tissue can be found.

In many cases no cause can be found for the condition. Tuberculosis is probably the most important causal factor. While no areas of tuberculosis could be found in this specimen, the history of tuberculosis in this patient is significant.

While chronic thyroiditis is very suggestive of malignancy, it differs in that it usually occurs under the age of forty, and the gland has not previously been the seat of the goiter. Further, the surface is not nodular as in carcinoma, and the lobe retains its normal shape.

DISCUSSION (on two above case reports)

Dr. J. M. Hayes felt that one of the most disappointing things in regard to Riedel's struma is the apparent difficulty of making a definite clinical diagnosis. He recalled a case he had seen about five years ago. The patient, a woman, had a basal metabolic rate of minus 15, but with many of the symptoms of hyperthyroidism. The uniform woody consistency of the gland led them to believe it was a case of this type, yet the possibility of malignancy had been suggested.

The patient was given thyroid extract but improved very slowly. She finally went to see Dr. H. Plummer, who also made a diagnosis of thyroiditis and advised against operation. She continued to take thyroid extract and apparently is well today.

Dr. Hayes called atention to Allen Graham's discussion of this subject at the National Goiter Association meeting in Kansas City. Graham emphasized the difficulty of making a differential diagnosis of this condition, and reviewed 104 cases gathered from the literature diagnosed as Riedel's struma. Of these he suggested that forty-two came under this classification, while twenty-four were classified as Hashimoto's struma, and others such as adenomata with fibrosis and inflammation, hyperthyroidism, tuberculosis of the thyroid, syphilis of the thyroid, suppuration, etc., were among this number. He emphasized the fact that both clinically and pathologically this condition was difficult to diagnose.

Dr. Rishmiller said his case had a metabolic rate of plus 68 and he had always questioned why there should be such a high metabolic rate when there was practically no tissue left. It occurred to him that one side might be functioning plus, and the other side functioning minus.

Dr. Nordland, in speaking of the difficulty of distinguishing Riedel's struma from carcinoma, said that it is not always easy, particularly if the thyroiditis occurred in a nodular goiter. The most important points in the differential diagnosis might be summarized as follows: The time in development is usually short, about six months; the normal shape of the gland is retained, that is, the poles can be made out; it is not attached to the skin and there is no enlargement of the cervical glands. At operation, in a well-developed carcinoma, the prethyroid muscles are usually attached firmly to the capsule and there is invasion of the vessels. Further, in carcinoma the change occurs mainly in one lobe.

With reference to the case reported by Dr. Rishmiller, and his question pertaining to the high basal rate, Dr. Nordland believed he was dealing with a case of diffuse lymphoid infiltration in its early stages. This is a type of thyroiditis reported by Hashimoto in 1912, and not a true thyroiditis as described by Riedel. The inclusion of this type of thyroiditis accounts for the recent reports of such large numbers of Riedel's stroma. This is the opinion of Ewing, who has classified diffuse thyroiditis into two types, the two types being a different stage of the same disease: (1) the diffuse lymphoid infiltration of Hashimoto; and (2) the replacement of acini by fibrous connecting tissue of Riedel.

Dr. Rishmiller said he was much interested in the case and happened to be in Ann Arbor a few months after seeing the patient, and while there questioned Dr. Warthin on the subject. Dr. Warthin claimed that northern Ohio has quite a large number of woody thyroids, while in this part of the country one sees very few.

Dr. George S. Bergh, of the University of Minnesota (by invitation), read his thesis which received first prize in the annual essay contest offered by the Surgical Society. This was entitled "Prophylaxis and Postoperative Treatment of Pulmonary Atelectasis, with the Use of Carbon Dioxide in Hyperventilation." Numerous lantern slides of charts were shown. (To be published separately.)

DISCUSSION

Dr. A. T. Mann thought the young man is to be congratulated on his work; that it is worthy of being the Society's prize essay.

Some phases of massive collapse of the lungs interest all physicians and surgeons. Dr. Mann suggested, too, that there may be more medical cases than one is conscious of; that this is a virgin field for the medical man to work in. In the first place, he felt that, as Pasteur was the first man to classify massive collapse and as his cases were all medical cases (cases of diphtheria), it is rather suggestive that the physician and the roentgenologist may have a productive field in their medical cases. Massive collapse in surgical cases is usually so amenable to treatment, even though the symptoms are so alarming, that it should stimulate the physician in the study of medical cases.

In regard to the real cause of massive collapse, or the real sequence of events which lead up to it, one is still considerably in the dark. It is known that it occurs less often after strong respiration than after quiet respiration. There is decreased vital capacity in all the cases in which it occurs, and with it there is more or less blocking of the air passages, and that blocking is tenacious mucus. But it is not settled at all as to the cause of the mucus plugs and the sequence of events which lead up to them and up to the massive collapse.

Dr. Mann felt it is possible that certain reflexes through the vagus or through the autonomic nervous system may first cause active contraction of the bronchioles and be the forerunning condition which allows the mucus to become viscid and form the obstruction which allows the collapse to occur.

In regard to the treatment of these mucus plugs, Dr. Mann said of course the nose and throat men have pulled some of them out through the bronchoscope, but some of the cases so treated have not recovered. He felt that bronchoscopy was a severe ordeal for a patient after a serious operation and with a massive collapse. It adds materially to the patient's depression.

As the essayist stated, collapse does occur under local and spinal anesthesia, as well as with general anesthesia. And it occurs in other than abdominal operations. It occurs sometimes without any anesthesia and without operation. Dr. Mann stated he had seen the record of one case in a young man with an injury to the hip. This patient went into a condiiton of massive collapse right under the doctor's eyes when he was in the X-ray laboratory for a diagnosis.

In regard to treatment of massive collapse, Dr. Mann felt there was no question at all about the use of CO_2 and its beneficial effects, and usually one good series of good breathing which clears out the whole lung stops the advance of the atelectasis. He called attention to the fact that Scott of Rochester, N. Y., who was the first to introduce this method widely, had in his first 2,000 cases of postoperative observations something like 1.5 per cent of atelectasis without the use of CO_2. In the next series of nearly 5,000 cases—the number in which they used it just after operation—they still had some cases of atelectasis, but there were only one-sixth as many. In other words, there were six times as many without the prophylactic CO_2 as with its use.

In using the posture methods, Dr. Mann felt there was one caution to be observed. It is a good thing to put the patient on the well side and percuss gently on the affected side in order to get the mucus out and get the lung open, but he should not be kept in that position too long or he may have an atelectasis on the well side.

Dr. Bergh (in closing) stated that in the postural treatment of Sante the patient is placed on the unaffected side, rolled back and forth, and is encouraged to cough.

With relation to prophylaxis, carbon dioxide should be used at frequent intervals because, while one may clear up a beginning atelectasis with a single administration, the condition is very likely to recur since factors predisposing to atelectasis are still present and the effects of the carbon dioxide are transitory. This tendency to recur is illustrated by the case reported by Hearn and Clerf from Dr. Jackson's Clinic, which recurred and necessitated drainage bronchoscopically seven times.

Dr. J. Frank Corbett, the retiring President, then read his Address on "The Problem of Cancer Treatment." (To be published separately.)

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

PROGRESS SECTION

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

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SURGERY

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EYE, EAR, NOSE AND THROAT

THE PROGNOSTIC SIGNIFICANCE OF SINUSITIS IN CHILDREN: Lyman Richards, M.D., Boston (Trans. Amer. Acad. Ophthal. & Otolaryng., 1931, p. 171). Within the past ten years there has arisen a recognition by the public of a new disease, sinusitis. In an effort to assemble sufficient data to more fully understand the problems, the author examined the records of 500 cases of sinusitis in children treated at the Children's Hospital in Boston over a period of fifteen years. These data were obtained by three avenues of approach: (1) hospital records; (2) replies to questionnaires sent to mothers of children so treated, and (3) X-ray films of children brought back for that purpose. Information was sought as to (a) course of the disease, following medical or surgical treatment or both; (b) status of the sinus itself, especially relating to symptoms, and (3) an estimation of the value of different types of treatment.

(1) The series comprised only those showing positive X-ray findings of involvement of the antra. The children were chiefly five to ten years of age. The cases were adjudged acute or purulent and chronic or thickened membrane. Treatment was divided into medical and surgical. The latter included (a) tonsillectomy and adenoidectomy, (b) antrotomy, (c) middle turbinectomy, and (d) radical surgery. In the case of chronic sinusitis medical treatment produced a very small percentage of cures (20 per cent) although a larger percentage improved (42 per cent); but surgery was very favorable, especially with tonsillectomy and adenoidectomy and turbinate removal. Other types of surgery produced chiefly improvement. In the case of acute sinusitis, here again medicine proved only beneficial by improvement in a greater percentage (50 per cent) of cases; but surgery, especially tonsillectomy (72 per cent) and antrotomy (57 per cent) produced the highest number of cures.

(2) Questionnaires brought answers in 150 instances and these showed that in both acute and chronic sinusitis, the results of medical treatment were better than those of surgical treatment. The average end-result of both forms of treatment was: cured 39 per cent, improved 18 per cent, unimproved 43 per cent.

(3) X-ray studies were made in 75 cases. These showed 41 per cent of the cases clear by re-X-ray, 10 per cent improved and 49 per cent unimproved. Of the cleared cases, 61 per cent were medically treated and 39 per cent surgically treated. X-ray findings checked with symptomatic cure or improvement fairly consistently.

The author urges further study of results of therapy to more fully understand the problems of sinusitis in children.

Frank W. Stevenson, M.D.

ASTIGMATISM—ITS ACCURATE DETERMINATION AND CORRECTION: C. S. O'Brien, M.D., Iowa City, Iowa (Trans. Amer. Acad. Ophthal. and Otolaryng., 1931, p. 75). The accurate determination and correction of astigmatism is of the utmost importance to every oculist. Few cases of hyperopia or myopia are uncomplicated by astigmatism. Correction of the astigmatism produces relief of discomfort.

The low myopic and the low to moderate hyperopic astigmatism produce the greatest amount of discomfort because of increased accommodative effort to overcome the errors present. The ciliary muscle is never quiet and gives rise to many asthenopic symptoms such as headache and ocular distress, diplopia, movement of objects, vertigo and referred pains to the shoulders and neck.

Astigmatism can be determined, in the high degrees, with the ophthalmoscope by focusing on the various retinal vessels. The ophthalmometer is of little value inasmuch as it measures only the corneal astigmatism and the latter is much altered by that present in the lens when the total error is determined. Skiascopy gives the closest approximation of the astigmatic error. Manifest refraction is often unsatisfactory due to unquiet accommodation and unequal contraction of the ciliary muscle. In myopes, the dynamic method is the best while in the hyperopes, the "fogging" method is more applicable. Cycloplegics are indicated in all except elderly persons with little accommodation. Scopolamin in 1/5 per cent aqueous solution is highly recommended. Homatropin often proves unsatisfactory.

Skiascopy by spheres and cylinders is recommended as the most accurate method of determining the astigmatic error. The meridian requiring the weakest lens is neutralized by means of spheres and the astigmatism neutralized with added cylinders in the axis of the band of light.

The subjective test under cycloplegic is advised although its success depends upon the reaction of the patient and the eye. The full correction is placed in the trial frame, the axis of the cylinder carefully checked and the sphere and cylinder reduced by 0.5D. Then the correction is strengthened by adding 0.25D until the best visual acuity is obtained. Jackson's crossed cylinders are highly recommended.

Relief is obtained when the cylinder properly neutralizes the astigmatic error. It is better to undercorrect slightly the cylinder than to overcorrect. In children, the full cylinder is always prescribed. With cylinders under 1D, always give full correction. Cylinders with an oblique axis are difficult to wear. In these cases, glasses are placed close to the eye, the optical centers lowered 3 to 4 mm. below the geometric center and the pupillary distance made to conform exactly to that of the patient. Lenses should not be round, as these turn in the frame and change axis. Frames should be strong, as bent frames will change the axis. Nose glasses should not be worn.

Frank W. Stevenson.

PEDIATRICS

GLYCEMIA IN CACHEXIA OF NURSLINGS: E. Jaso, M.D., Assistant Physician, Provincial Institute of Puericulture, Madrid, Spain (Amer. Jour. Dis. Children, Vol. 43, No. 5, May, 1932). Cobliner found that the blood sugar was lower in malnourished infants than in normal ones. The conclusion is drawn that the degree of glycemia in dystrophic infants is lower than in normal ones. The figures given by the authors mentioned show an average blood sugar of 0.72 mg. in dystrophic infants. Considering 0.88 as the normal average for nurslings, this average is seen to be 18.9 per cent lower. The lower the blood sugar, the more accentuated the nutritional disturbance will be.

According to the author's data, the average dextrose content of the blood in the nutritional cachexias is 0.53 mg. per thousand cubic centimeters.

The nearer to the time of death that the determination was made, the lower, in general, was the figure for the blood sugar. In the ten days preceding death, the blood sugar was 0.32 mg. on an average; between ten and twenty days prior to death, it reached an average of 0.47 mg., and more than 30 days before death, the average was 0.57 mg.

The tolerance of hypothreptic infants for dextrose seems to be even greater than that of healthy infants.

The existence of a blood sugar value that is, on an average, 43 per cent lower than normal is confirmed in simple nutritional cachexias. The intensity of hypoglycemia is in proportion to the denutrition. The presence of hypoglycemia has not been confirmed in dystrophies of specific cause (syphilis, tuberculosis). The blood sugar remains within normal limits in hypothreptic infants in whose diet cereals are included. The blood sugar returns to its normal value when the patient with athrepsia is progressing toward recovery. The blood sugar of nurslings can fall as low as 0.3 mg. per thousand cubic centimeters without clinical signs of hypoglycemia.

R. N. Andrews, M.D.

VALUE OF PROPERLY MODIFIED POWDERED MILK IN INFANT FEEDING: H. R. Litchfield, M.D., Brooklyn (Arch. Ped., Vol. XLIX, No. 5, May, 1932). In some cases, circumstances are such that early weaning becomes a necessity; then we must choose our food for the infant with the utmost care.

When, however, definite indications arise which make it imperative that an infant be weaned early, the problem of adequate and proper feeding is one which taxes the ingenuity of even the most careful practitioner. The preventive measures necessary against malnutrition are proper diet, proper hygiene and normal amount of exercise. If the child is not nursed, properly modified powdered milk in correct dilution is suitable for infant feeding.

Eighty-four newborns were given Lactogen as a routine feeding instead of plain water within 18 hours after birth, the dilution being one tablespoon of Lactogen to two ounces of boiled water. Sixteen cases had the usual drop in weight at the end of three days, but picked up very rapidly thereafter. Sixty-six infants showed no loss in weight and gained daily and were far past their birth weight at the end of 12 days.

The results of this extensive test with Lactogen proved to the author that it can be used in place of fresh whole milk very successfully as routine in infant feeding and for the supplementary feedings of the newborn.

In caring for these artificially fed infants, the author keeps adding the vitamins A, B, and C. The administration of orange juice and cod liver oil begins not later than the end of the first month, cereals at the end of the third month, egg yolk at the end of the fourth, and green and starchy vegetables at the end of the sixth month.

R. N. Andrews, M.D.

THE PEDIATRICIAN'S OBLIGATION—A PSYCHOANALYTICAL OBSERVATION DEALING WITH THE PREVENTION OF NEUROSES IN CHILDREN: Bertrand S. Frohman, M.D. (Arch. Ped., June, 1932, Vol. XLIX, No. 6). We are once more approaching a phase which we may term psychological medicine. The author firmly believes that many of the neuroses which the general practitioner, psychiatrist and psychoanalyst are confronted with are preventable.

Many of the child's problems, psychologically speaking, are parental ones. Few parents realize that these curious little witnesses of the domestic upheavals register far more than adults recognize. The child's physician has the opportunity of entering the home sensing the domestic atmosphere and if he is observing can prognosticate as to the future nervous make-up of his little patient. He should never forget that the child patterns his human objective after one or both of the parents.

The author should like to impress the reader with the necessity of the pediatrician's careful observation of the home environment and particularly a study of the parent. This message is inspired purely in the ideal of stimulating the pediatrician to further consider the psychological phase of his specialty and to enlarge upon his field of endeavor.

R. N. Andrews, M.D.

SURGERY

SURGERY OF HYPOSPADIAS AND EPISPADIAS IN THE MALE: Arthur B. Cecil, M.D. (Jour. Urol., Vol. 27, No. 5, May, 1932, p. 507). This is an excellent review of the surgical treatment of these congenital defects. The author reviews the most important advances and operative technic developed in this field.

The most important and fundamental principles are absolute diversion of the urinary stream, accompanied by occlusion of the urethra by suture. No drainage tubes, probes, nor any other foreign bodies should be left in the newly formed urethra.

The correction of the deformity is done as a primary operation during the first two years of life, and no further plastic work done until the deformity is definitely cured. Autoplastic free grafts, such as veins, arteries, etc., have proven unsatisfactory, and are usually followed by sloughing or suturing.

The advancement of the urethra, according to Beck's technic, is used in only minor degree cases of hypospadias. The most successful method of reconstructing the urethra is the method of Thiersch with suitable modifications.

Epispadias is curable only if the incontinence can be controlled by proper sphincter plastic. This is best done by reconstructing the bladder neck and urethra according to Young's method.

There are a number of very good diagrams, showing Thiersch's method of reconstructing the urethra in both penile and perineal hypospadias.

A. E. Sohmer, M.D.

BOOK REVIEWS

NNUAL REPRINT OF THE REPORTS OF THE
COUNCIL ON PHARMACY AND CHEMISTRY
F THE AMERICAN MEDICAL ASSOCIATION
OR 1931. Cloth. Price, $1.00. Pp. 100. Chicago:
merican Medical Association.

This volume contains the collected reports of the
tion of the Council on Pharmacy and Chemistry on
products which have been found unacceptable or
ich have been omitted from New and Non-official
medies during the past year. It contains also the
ecial reports authorized by the Council during the
ar and preliminary reports on articles which show
omise but which are not yet ready for admission to
ew and Non-official Remedies nor suitable for gen-
al use by the medical profession. Among the reports
products found unacceptable are those on Thy-
ophysin, a preparation of posterior pituitary and thy-
us, advocated as a safe and reliable means of accel-
ating delivery and marketed under false claims as to
essential action, as to its strength, and as to its
fety for mother and child; on Bismuthoidal, claimed
be colloidal bismuth, and marketed with unwarranted
aims of value in the treatment of syphilis intrave-
ously; on Frenly Enema Cream, a complex, unscien-
ic mixture, marketed under a therapeutically sugges-
ve name with unwarranted claims of therapeutic value
a host of conditions; on Hayner's Normaline, an
original preparation of formaldehyde and zinc chlor-
e marketed under a non-informing name without a
antitative statement of composition on the label or
the advertising and with unwarranted and mislead-
g claims; on Pernocton, a barbituric acid product
arketed under a therapeutically suggestive name and
ith unacceptable recommendations for intravenous
se; on Solution Normet, an unscientific mixture of
trates, marketed with unwarranted claims; on Alqua
ater, Calso Water, and Alka Water, irrational, pro-
rietary "alkalizing" mixtures marketed with unwar-
anted and misleading claims. The preliminary reports
n Nucleotide K 96, a preparation of pentose nucleo-
des which has shown promise in the treatment of leu-
openia, and on Carbarsone, p-carbamino-phenyl arsonic
cid, proposed for use in amebiasis but needing further
onfirmatory evidence of value, are both timely and interesting. Perhaps the most noteworthy are the special reports, The Intravenous Use of Barbital Compounds and The Average Optimum Dosage of Cod Liver Oil. The former gives the Council's considered verdict on the dangers and limitations of the use of barbitals intravenously and the latter gives the result arrived at from a questionnaire sent to leading pediatricians.

NEW AND NON-OFFICIAL REMEDIES, 1932, containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1932. Cloth. Price, postpaid, $1.50. Pp. 492. lvi. Chicago: American Medical Association.

The recognition of a preparation for inclusion in this book singles it out from the host of new products of the pharmaceutical manufacturers as being a worthwhile addition to the existing armamentarium of the practicing physician. To be thus distinguished it must be shown, under the impartial scrutiny of the carefully chosen group which is the Council on Pharmacy and Chemistry, that it has acceptable evidence of therapeutic usefulness and that it is marketed in accordance with the honesty and straightforwardness envisaged by the excellent Rules which have been the outgrowth of the Council's quarter century experience in appraising the merits of new drugs.

In accordance with its custom of keeping the annual editions of New and Non-official Remedies in the forefront of current medical thought, the Council offers in this volume the newly revised articles: Barbital and Barbital Compounds; Fibrin Ferments and Thromboplastic Substances; Liver and Stomach Preparations; Mercury and Mercury Compounds; and Ovary. Perhaps the most noteworthy new preparations admitted are: nupercaine-Ciba, a local anesthetic; pentobarbital sodium, a barbituric acid derivative; and iopax, a new preparation for roentgenologic use. All of the ovary preparations formerly described are omitted and none of the new standardized preparations are described, although the names Theelin and Theelol are recognized in the revised general article. Another change of importance is the classification of articles formerly listed as "Exempted" under the heading "Accepted but Not Described." There is the usual excellent index and the augmented Index to Proprietaries Not Included in N. N. R.

HREE GENERATIONS of experience in grinding, specializing in fine surgical instruments. Prices, reasonable. Schwarz Grinding Service, Foot-Schulze Bldg., 128 10th St. E., St. Paul. Telephone, Midway 9939.

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MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
LIST OF PHYSICIANS LICENSED MAY 24, 1932

BY EXAMINATION
(April)

Name	School and Date of Graduation	Address
Belzer, Meyer Simon	U. of Minn., M.B., 1931	K. C. Gen. Hosp., Kansas City, Mo.
Benesh, Norbert George	U. of Nebr., M.D., 1931	Asbury Hospital, Minneapolis, Minn.
Borland, Verl Gideon	U. of Minn., M.B. and M.D., 1932	University Hospital, Minneapolis, Minn.
Borman, Chauncey Nord	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Darnall, Charles Milton	U. of Texas, M.D., 1930	Mayo Clinic, Rochester, Minn.
del Plaine, Carlos Werter	U. of Minn., M.B., 1931	1633 E. River Terrace, Minneapolis, Minn.
Deuterman, Joel LeRoy	U. of Va., M.D., 1930	Mayo Clinic, Rochester, Minn.
Farsht, Irving Joseph	U. of Minn., M.B., 1931	1124 N. Washburn Ave., Minneapolis, Minn.
Fine, Benjamin A.	U. of Minn., M.B., 1931	699 Iglehart Ave., St. Paul, Minn.
Haines, William Henry	U. of Minn., M.B. 1931; M.D., 1932	1218 W. Superior St., Duluth, Minn.
Hassett, Myron Frederick	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Herman, Samuel Morton	U. of Minn., M.B., 1931	711 Carroll Ave., St. Paul, Minn.
Johnson, Spencer	Rush Med. Col., M.D., 1929	Mayo Clinic, Rochester, Minn.
Johnston, Leonard Frederick	U. of Minn., M.B., 1931	4816 Garfield Ave., Minneapolis, Minn.
Leck, Paul Clifford	U. of Minn., M.B. and M.D., 1931	General Hospital, Minneapolis, Minn.
Lindgren, Russell Cyrus	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Macy, John Willis	U. of Iowa, M.D., 1928	Mayo Clinic, Rochester, Minn.
Mears, Burtis J.	U. of Minn., M.B., 1931	Miller Hospital, St. Paul, Minn.
Murphy, Cornelius Bernard	U. of Minn., M.B. 1930; M.D., 1931	St. Lukes Hospital, St. Paul, Minn.
Nuetzman, Arthur William	U. of Minn., M.B., 1931	810 26th Ave. N. E., Minneapolis, Minn.
Olson, Paul Frederick	Rush Med. Col. M.D., 1932	Mayo Clinic, Rochester, Minn.
Peterson, Willard Henry	U. of Minn., M.B., 1931	2925 33rd Ave. S., Minneapolis, Minn.
Rogne, William Gustav	U. of Minn., M.B., 1930; M.D., 1931	Casselton, N. Dak.
Schulze, Victor Ewald	U. of Texas, M.D., 1928	Mayo Clinic, Rochester, Minn.
Simonson, Sigwert Wallace	U. of Minn., M.B., 1931	Miller Hospital, St. Paul, Minn.
Sonnesyn, Nels Nitter	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Sterner, Ernest Russell	U. of Minn., M.B., 1931	1072 Portland Ave., St. Paul, Minn.
Stevens, George Arnold	Col. of Med. Evang., M.D., 1930	Mayo Clinic, Rochester, Minn.
Stuart, Frank Allan, Jr.	U. of Tenn., M.D., 1930	Mayo Clinic, Rochester, Minn.
Trotter, Fred Oscar	U. of Minn., M.B., 1932	681 Lawson St., St. Paul, Minn.
Youngerman, William Martin	U. of Cincinnati, M.B., 1930; M.D., 1931	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Chadbourn, Charles Rufus	Northwestern, M.D., 1931	203 Prescott St., St. Paul, Minn.
Furrer, Emil Daniel	U. of Ore., M.D., 1929	Mayo Clinic, Rochester, Minn.
Ingebrigtson, Ernest K. G.	Rush Med. Col., M.D., 1931	Moorhead, Minn.
McCrimmon, Herman Patrick	U. of Okla., M.D., 1925	3130 Excelsior Ave., Minneapolis, Minn.
Niles, Sidney C.	Northwestern, M.D., 1907	Hamm Bldg., St. Paul, Minn.
Nylander, Emil G.	Chic. Col. M. and S., M.D., 1917	Ellsworth, Wis.

BY NATIONAL BOARD

Dwan, Paul Francis	Harvard Univ., M.D., 1928	4509 Dupont Ave. S., Minneapolis, Minn.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XV SEPTEMBER, 1932 No. 9

CYSTOSCOPIC PROSTATECTOMY

A FURTHER REPORT*

FREDERIC E. B. FOLEY, M.D.
Saint Paul

THE original presentation under this title was made before the Twin City Urologic Society during the winter of 1927[10] and was followed by a preliminary report in the Journal of Urology.[11] It described a new instrument and method for cystoscopic prostatectomy that represented a radical new departure in the treatment of vesical neck obstruction and contained the first reported attempt at transurethral excision of sufficiently extensive portions of the gland to adequately correct obstruction due to large adenomatous hyperplasia.

The punch instruments and methods then in use, because of the small excisions possible with them, had been restricted to bars and contractures except by Caulk,[3] who recommended his own cautery punch in a considerable proportion of obstructions due to ordinary types of benign hypertrophy. The Stern cutting current punch[16] had proved incapable of extensive tissue removal. Faults in its design had made it inferior to its predecessors for small removals and it had been abandoned by its originator.[13]

Unlike punch instruments, the purpose of the new instrument was to relieve all types of vesical neck obstruction, including particularly those caused by large adenomatous hyperplasia. The original instrument and method, presented in 1927, were and still are the only radical departure from the punch and punch principle. They demonstrated that practically any desired extent of the obstructing prostate could be rapidly and accurately excised by an electrode projected far beyond the sheath lumen, thus radically departing from the punch principle and escaping the limitation imposed by excising only tissue that could be impressed into the fenestrum of a punch.

The original procedure was handicapped by rather crude instruments but more so by the very inadequate cutting current generators then available. These generators would not activate in water medium the large surface area of the electrode used. The first attempt to overcome the latter handicap was made by using steep Trendelenburg position to secure passive air distention of the bladder. An immediate fatality due to air embolism of the heart was the result. Inert mineral oil, which is a non-conductor, was then resorted to for bladder distention. This permitted activation of the cutting electrode but the combustion accompanying either cutting or coagulating clouded the oil and its viscosity made rapid flow and clearing of vision impossible, so that the excision once started had to be completed without deliberation or interruption.

In spite of these handicaps a few thoroughly successful cystoscopic prostatectomies were done. These few cases made at once apparent the remarkable possibilities of the instrument and method and prompted the prediction, made at that time, that prostatectomy by ordinary methods would be obsolete within ten years—a prediction that already has gone long strides toward realization.

This was the preface and point of departure to so-called "Transurethral Prostatic Resection." The development of the latter procedure has departed from the ambitious purpose of the original instrument and method as indicated by adoption of the term "Transurethral Prostatic Resection" as contrasted with the more radical "Cystoscopic Prostatectomy."

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*Presented before the Minnesota State Medical Association meeting, Saint Paul, Minn., May 25, 1932.

Attempt at clinical use of the original instrument and procedure, beyond the few cases mentioned, did not seem justified until the technical difficulty with which it was handicapped could be removed by an adequate cutting current generator. As noted in the preliminary report development of such a generator with early success in routine clinical use of the procedure was in prospect by the promised collaboration of a manufacturer. This collaboration did not materialize but without it the generator was produced.[14] That it could have been made available for this purpose was not known until it was put on the market.

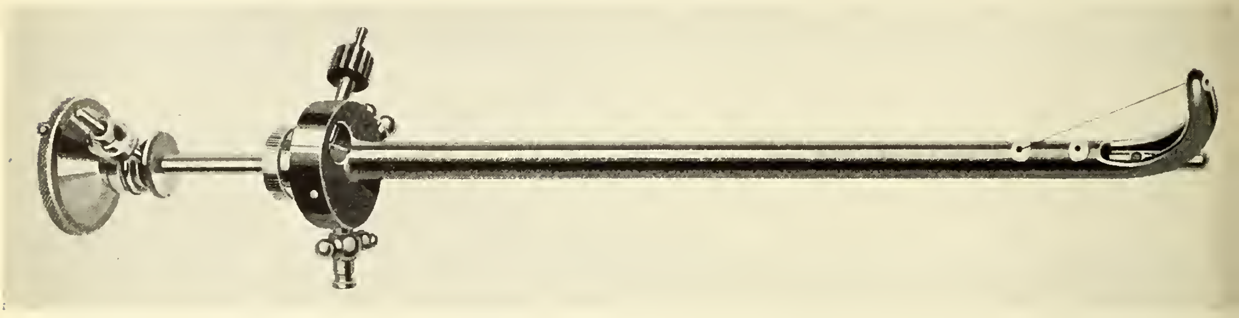


FIG. 1. ORIGINAL FOLEY PROSTATE EXCISOR: ASSEMBLED FOR OPERATION.

The sheath is of vulcanized hard rubber made in the form of a hollow urethral sound of Van Buren curve. Through a slot in the curved end, continued as a fenestrum in the concave wall of the sheath, the cutting current electrode may be viewed with a right angle vision telescope. The latter is shown in the sheath in position for operation. The electrode wire, attached at the tip of the curved end of the instrument enters a tubular conduit in the sheath wall through which it extends back to a spindle or reel at the proximal end of the sheath. By means of this reel the electrode wire may be drawn taut as shown here, in position for operation, or slacked off to lie along the curve of the instrument for introduction as shown in Figure 2. (Journal of Urology.)

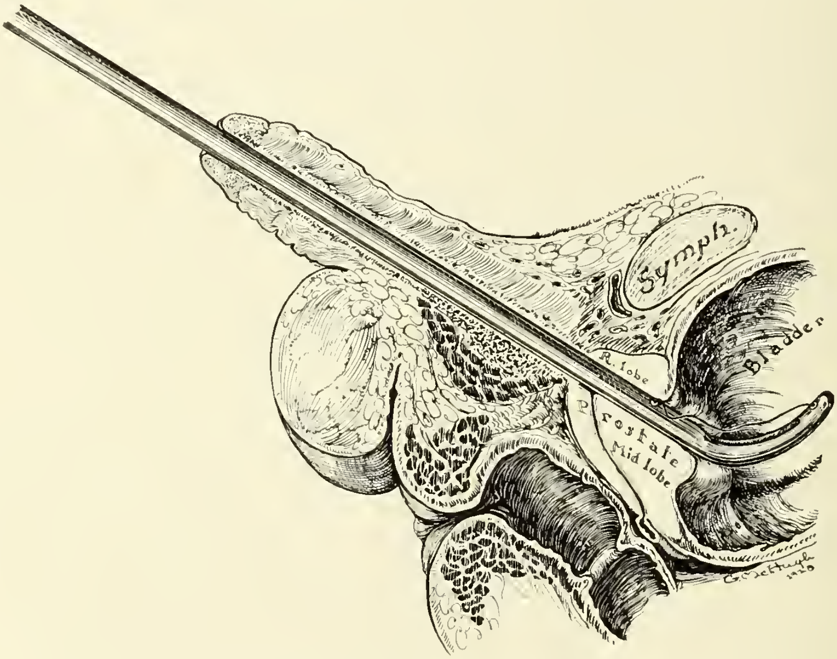


FIG. 2. CYSTOSCOPIC PROSTATECTOMY. ORIGINAL INSTRUMENT AND METHOD. INTRODUCTION OF INSTRUMENT.

The wire electrode is slack, the telescope is drawn back into the sheath of the instrument. The instrument is introduced in the manner of passing a curved urethral sound. (Journal of Urology.)

In the interval since the writer's preliminary report, elaborations of the punch instrument and method have been imposed in the treatment of practically all types of vesical neck obstruction, and with a remarkable degree of success.

The forerunner of all these extensions of the punch instrument and method was Caulk,[4] whose addition to the punch instrument of galvanic cauterization for control of bleeding permitted the making of "multiple punches" at a single procedure. The significance of Caulk's work does not appear to be properly emphasized in current publications concerning the methods now in vogue.[5]

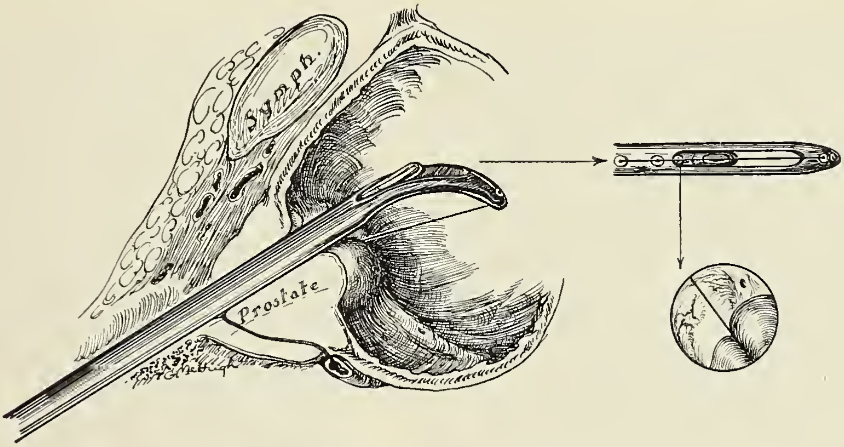


FIG. 3. CYSTOSCOPIC PROSTATECTOMY: ORIGINAL INSTRUMENT AND METHOD. PREPARATION FOR BEGINNING INCISION.

The beak of the instrument has been rotated posteriorly, being directed over the right postero-lateral quadrant. The telescope has ben advanced into tbe sheath and, as shown in the insert, the lens is placed at the lower margin of the fenestrum. The second insert shows the cystoscopic view obtained: the right ureteral orifice is seen in the background, the wire electrode is entering the cleft between the hypertrophied mid lobe and right lateral lobe. (Journal of Urology.)

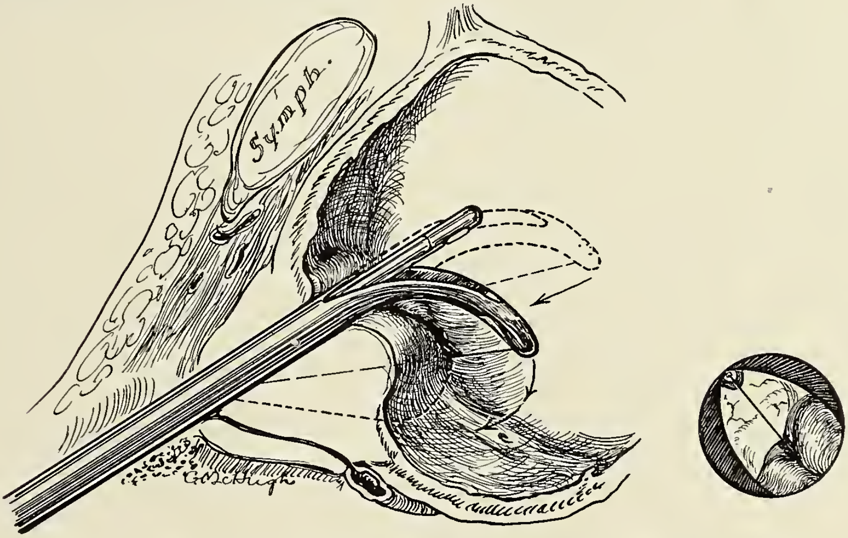


FIG. 4. CYSTOSCOPIC PROSTATECTOMY: ORIGINAL INSTRUMENT AND METHOD. FIRST PART OF INCISION.

The dotted outline indicates the position of the instrument in the urethra as it was at the beginning of the incision, as shown in Figure 3. The whole instrument has been withdrawn to the new position shown here. The high frequency cutting current is supplied to the electrode during this movement and a radially directed incision back into the gland is thus made. At the vesical aspect this incision extends toward the periphery of the gland a considerable distance away from the urethra. In the substance of the gland the bottom of the incision approaches the instrument shaft and terminates in the floor of the urethra. Rotation of the instrument, as indicated by the curved arrows, will continue this incision along the circular dotted line. Note that the telescope has been advanced into the sheath to compensate for the distance the sheath was withdrawn so that the prostate profile, as shown in the insert, is again in view.

The outstanding contributor to the recent and more successful extensions of the punch method has been T. M. Davis. He undertook to rehabilitate the abandoned, and originally unsuccessful, Stern punch.[6] This was the first punch instrument to apply the high frequency cutting current to the cutting element. By improvements in design and construction of the instrument and by remarkable persistence, temerity, and endurance, Davis has imposed this instrument in practically all types of vesical neck obstruction.[7] His accomplishment is greatly to be admired; the more so when account is taken of the faults of the original instrument and the handicap of the cutting current generators then available. We are vastly indebted to Davis for so conclusively demonstrating the feasibility of "multiple punches" or "Transurethral Prostatic Resection," as this procedure in its present successful form is now called.

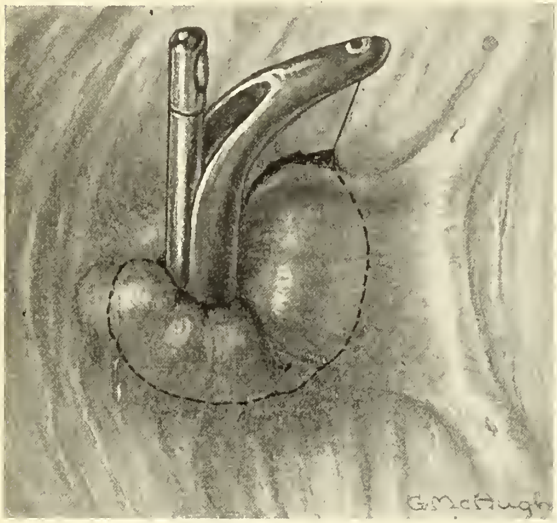


FIG. 5. CYSTOSCOPIC PROSTATECTOMY: ORIGINAL INSTRUMENT AND METHOD. ROTATING PART OF INCISION.

The radially directed portion of the incision has been made. The dotted line indicates the path along which the incision will be continued by rotation of the instrument. The incision may be extended farther into the periphery of the gland by withdrawing the instrument and elevating the ocular end. It may be brought closer to the urethra by advancing the instrument into the bladder and depressing the ocular end. (Journal of Urology.)

Davis' success in this undertaking was followed by McCarthy,[15] who devised another elaboration of the punch. This very successful instrument, the so-called "Visualized Prostatic Electrotome," makes use of the principles and design originated by Stern, in that the "punch" or cutting element is a wire loop to which a high frequency cutting current is supplied. The loop is moved longitudinally almost entirely within the sheath lumen. Others who have elaborated on the punch instrument and method are Bumpus,[2] Day,[9] and Kerwin.[12] These contributors have devised various forms of the punch with the addition of electro-coagulation of the tissue to be excised preceding the punch cut, thus permitting multiple punches at a single procedure.

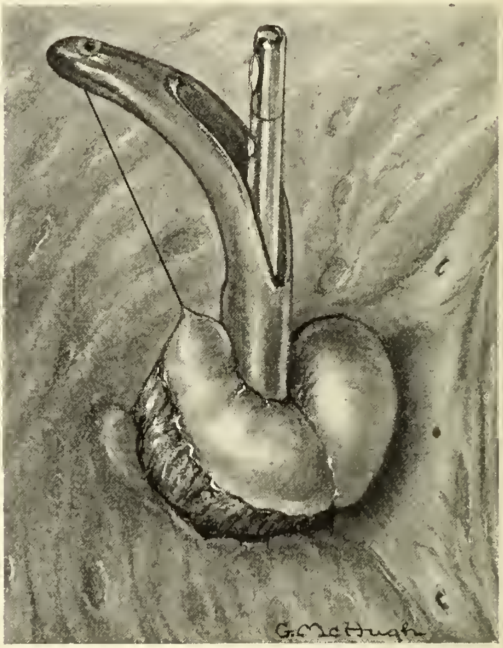


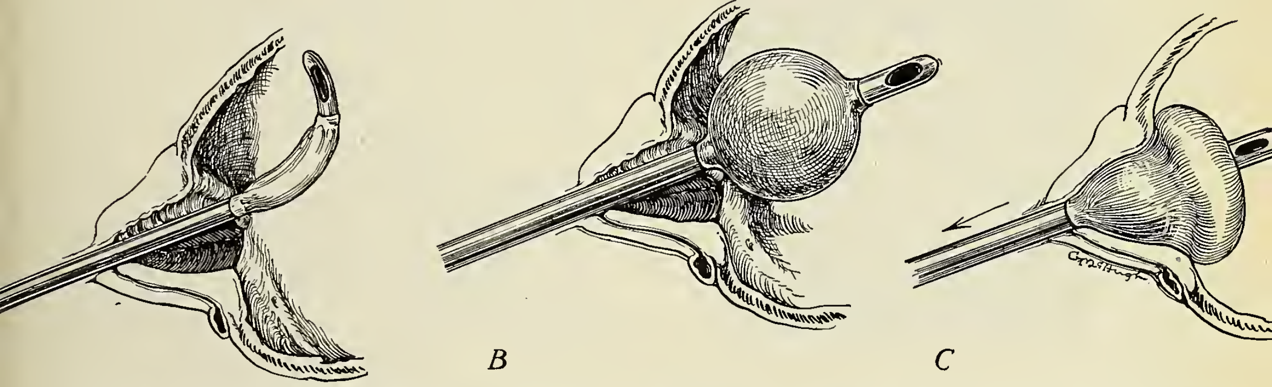
FIG. 6. CYSTOSCOPIC PROSTATECTOMY: ORIGINAL INSTRUMENT AND METHOD. COMPLETION OF INCISION.

Rotation of the beak anteriorly has been completed. The instrument has been advanced back into the bladder, projecting the electrode above the vesical neck and causing it to emerge from the tissue with completion of the incision. (Journal of Urology.)

The present improved cutting current generators, unlike their predecessors, are easily capable of activating in water medium the large surface area electrode of the writer's original instrument described in 1927. The most serious obstacle to routine clinical use of the instrument and method thus was removed. Immediately this was known the effort to make the instrument and method satisfactory for routine clinical use was resumed.

The present further report describes improvements in the design and construction of the original instrument and improvements in operative technic that make "Cystoscopic Prostatectomy" an accomplished fact. Accordingly the title of the preliminary report, "Cystoscopic Prostatectomy," with all its implied ambition, is adhered to as appropriate.

THE ORIGINAL FOLEY PROSTATE EXCISOR



IG. 7. CYSTOSCOPIC PROSTATECTOMY: ORIGINAL INSTRUMENT AND METHOD. INTRODUCTION OF HEMOSTATIC BAG CATHETER. A, passage on stylet, the catheter being advanced well up into the bladder. B, distention of bag. C, bag drawn down into prostatic fossa. (Journal of Urology.)

The original instrument and method are illustrated in the drawings and photographs Figure 1 to Figure 7 inclusive. These illustrations are reprinted from the Preliminary Report, The Journal of Urology, volume XXI. The construction of the original instrument and the operative technic are sufficiently described in the captions of these illustrations to require no further comment.

The excised piece of tissue was removed from the bladder at a second stage cystoscopic procedure.

As already noted a few successful cystoscopic prostatectomies were done with the original instrument and method. Figure 8 and Figure 9 illustrate respectively the preoperative and postoperative appearance of the vesical neck in one of these cases. This patient completely empties the bladder and is relieved of all urinary symptoms.

Although the technical difficulties already mentioned prevented routine clinical use of the procedure these few cases at once made apparent the remarkable possibilities of the instrument and method. They demonstrated that with this complete departure from the punch principle, consisting essentially of a cutting current electrode supported at both proximal and distal ends and projected far beyond the sheath lumen, it was possible to excise almost any desired extent of the obstructing prostate.

Tests with the new high frequency cutting current generators made it appear that they would eliminate the major technical difficulties of the procedure. This has proved to be the case.

The vastly increased capacity of the new generators makes oil distention of the bladder unnecessary and permits the use of water as cystoscopic medium. Rapid irrigation with water keeps the field clear and the excision may be made with deliberation while bleeding is controlled by supplying a fulgurating or coagulating current to the electrode when needed for this purpose.

Immediately these facts were known there was encouragement and warrant to undertake improvements in design and construction of the instrument and operative technic. This has been done and the procedure has been made satisfactory for regular clinical use.

It will be noted that in the original instrument the electrode was attached to the sheath and was moved entirely by movement of the sheath. Accordingly the position of the telescope within the sheath had to be constantly adjusted to the changing positions of the sheath in order to have the vesical neck properly in view during operation of the electrode. Moreover, with the right angle vision telescope used, the projecting lobes were seen chiefly in profile and if they projected much their peripheral extent was cut from view.

THE IMPROVED FOLEY PROSTATE EXCISOR

In the new instrument the troublesome factors mentioned above have been eliminated by use of a retrospective telescope and a mechanism for moving the electrode independently of the sheath and telescope. The end of the sheath and telescope remain at a constant level above the vesical neck and the view is directly down on it with the peripheral extent of prostatic enlargement always in the visual field.

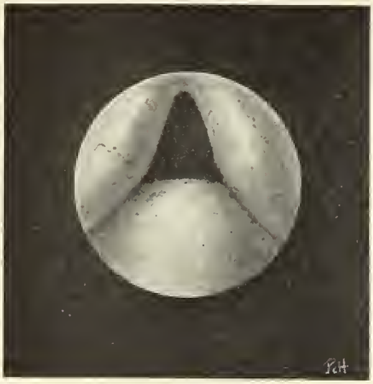


FIG. 8. CYSTOSCOPIC PROSTATECTOMY: ORIGINAL INSTRUMENT AND METHOD. PREOPERATIVE APPEARANCE OF VESICAL NECK AS VIEWED IN PROFILE FROM BELOW WITH BUERGER'S STRAIGHT FORWARD VISION URETHROSCOPE.

There is an elevated, well rounded, projecting mid-lobe enlargement between two moderately enlarged lateral lobes. The junctions of the mid-lobe and lateral lobes are marked by deep clefts in the postero-lateral quadrants.

In making the radial parts of the incision the electrode is moved independently of the sheath and telescope, which remain in fixed position while the electrode is seen to incise the gland in an otherwise fixed visual field. This constant position of the sheath is altered only when the whole assembly is rotated in the urethra to make the circular part of the incision. These features have eliminated many troublesome and confusing details in manipulation of the instrument.

The new instrument is simply an extension of the principle described in 1927. Figure 10 is a schematic perspective and sectional view of the new instrument showing details of its design and construction.

The sheath is a straight metal tube of ovoid cross section, size F29. One wall is cut away in the form of a fenestrum continuous with its open end. With this sheath in place in the urethra the working element may be introduced and removed through it at will.

The working element (Fig. 10) is the essential part of the instrument. It is built about a retrospective telescope.* A "deflecting arm," carrying a lamp, is hinged on top of the telescope. A spring mechanism keeps this arm constantly under upward tension. The electrode wire extends from the tip of the arm down to an insulated conduit tube through which it runs back to a reel. The reel serves only to pre-adjust and fix the wire to the length shown in the "position for introduction." It is not used in the actual operative manipulations. The conduit tube is joined to a rack and pinion mechanism by which it may be slid backward or forward on the telescope. The linear movement of the conduit, plus the arcuate movement of the deflecting arm, imparts two components of motion to the cutting element with a resultant movement ideally suited to the intended purpose.

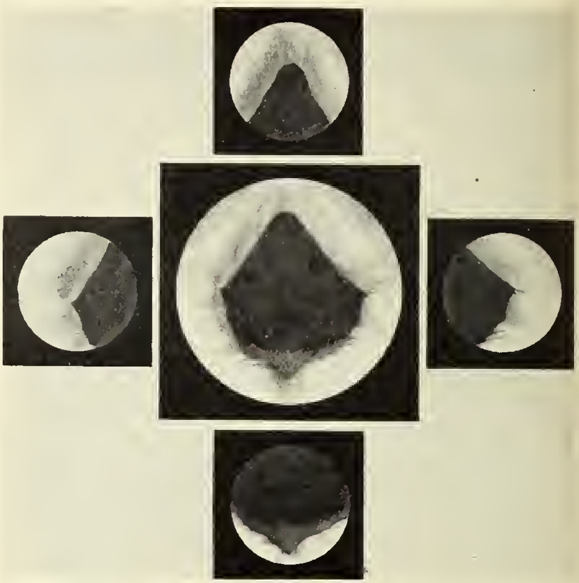


FIG. 9. CYSTOSCOPIC PROSTATECTOMY. ORIGINAL INSTRUMENT AND METHOD. SAME CASE ILLUSTRATED IN FIGURE 8. POST-OPERATIVE APPEARANCE OF VESICAL NECK AS VIEWED IN PROFILE FROM BELOW WITH BUERGER'S STRAIGHT FORWARD VISION URETHROSCOPE.

The vesical neck is too widely open for its whole circumference to come within a single close up field. The small close up profile views of the vesical neck in anterior, posterior and both lateral quadrants were obtained by deflecting the shaft of the instrument in corresponding direction. The large view in the center is a composite of these. The whole mid-lobe and the posterior extensions of both lateral lobes have been removed. The remaining portion of the trigone and the inter-ureteric ridge are dimly visible continuous with the resected vesical neck and urethral floor.

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*A new excisor is being constructed in which both retrograde vision of the vesical neck and foroblique vision upward through the urethra are available with the same telescope, which is made a movable part of the working element: retrograde vision being obtained when the telescope with its objective lens is pushed forward close to the mirror and foroblique vision when it is drawn away from the mirror down into the urethra.

An irrigating duct (Fig. 10) alongside the electrode conduit makes a contact union with the left hand petcock of the sheath and, through a slit-like opening near its vesical end, a brisk stream of water is delivered in the visual field within the bladder. A "down draft" return flow occurs through the space along the other side of the telescope and through the right hand petcock.

In the photograph (Fig. 11) the obturator, sheath and working element are shown. The latter is in position for introduction. The rack and pinion mechanism which moves the electrode conduit is all the way forward and permits the deflecting arm to assume a position parallel to the shaft of the instrument, at the same time retracting the electrode close to the instrument.

The photographs in Figure 12 show the working element in place in the sheath. In the upper one the rack and pinion mechanism has been turned back a short distance, making traction on the electrode conduit and wire, thus tipping the light over into position to illuminate the vesical neck. With the instrument in the urethra, in position for operation, the electrode would now be ready to enter the urethra for the beginning of the incision.

In the lower photograph (Fig. 12) the cutting element has completed its excursion, this move-

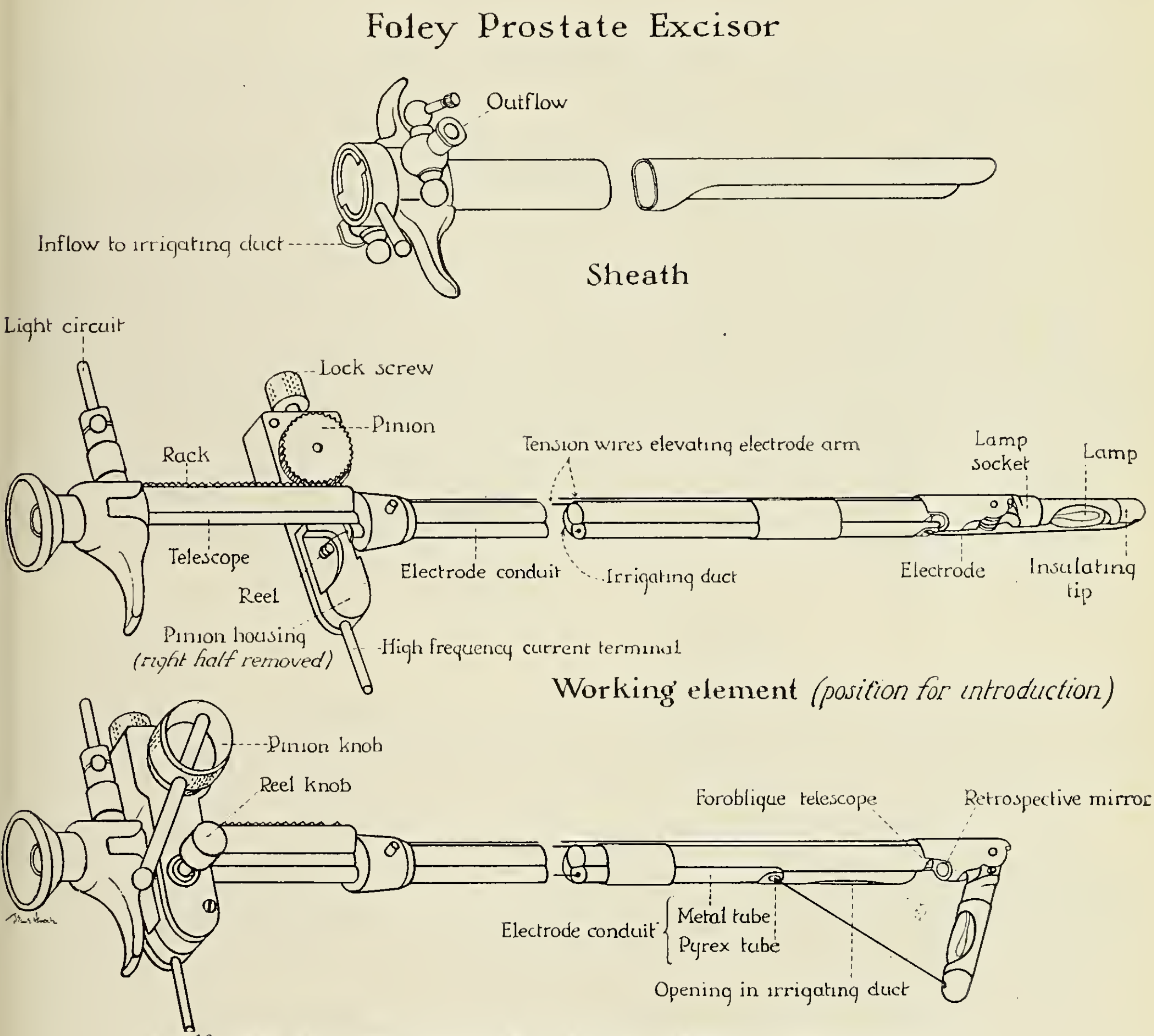
Foley Prostate Excisor
Outflow
Inflow to irrigating duct
Sheath
Light circuit
Lock screw
Pinion
Rack
Tension wires elevating electrode arm
Lamp socket
Lamp
Telescope
Reel
Electrode conduit
Irrigating duct
Electrode
Insulating tip
Pinion housing (right half removed)
High frequency current terminal
Working element (position for introduction)
Pinion knob
Reel knob
Foroblique telescope
Retrospective mirror
Electrode conduit
Metal tube
Pyrex tube
Opening in irrigating duct

FIG. 10. NEW FOLEY PROSTATE EXCISOR: SCHEMATIC PERSPECTIVE AND SECTIONAL VIEWS. For description see text, pages 572 and 573.

ment having been effected by operation of the rack and pinion mechanism which is now at the end of its travel.

CYSTO-URETHROSCOPIC MEASUREMENTS

Before undertaking excision of the obstructing portions of the prostate a thorough and detailed survey of the vesical neck and prostatic urethra by means of retrospective, right angle and foroblique telescopes is essential. Fairly exact measurements are made to determine the extent of peripheral enlargement and how far down in

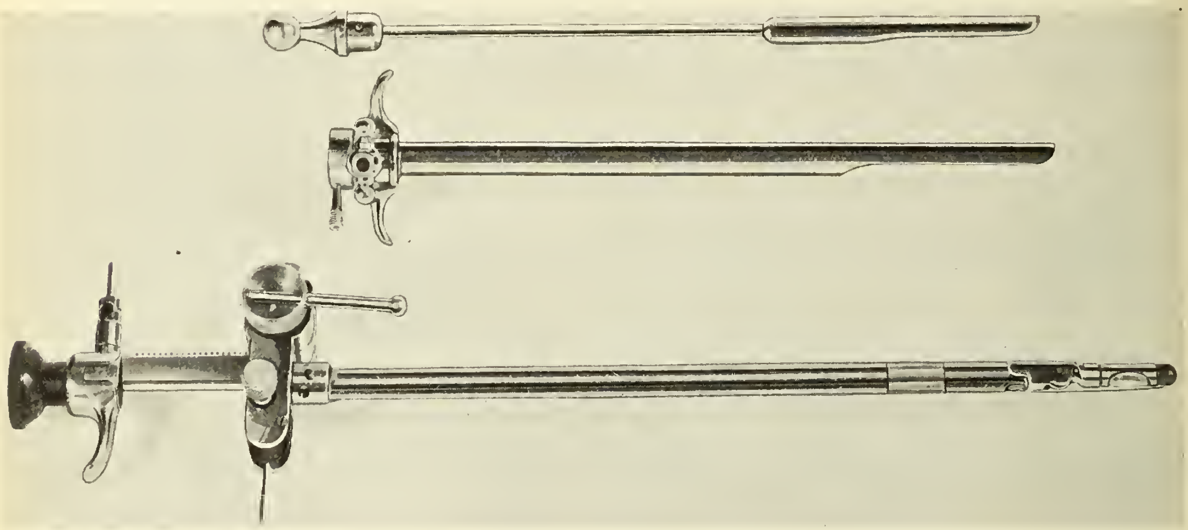

FIG. 11. NEW FOLEY PROSTATE EXCISOR: PHOTOGRAPH OF OBTURATOR, SHEATH AND WORKING ELEMENT.
For description see text, page 573.

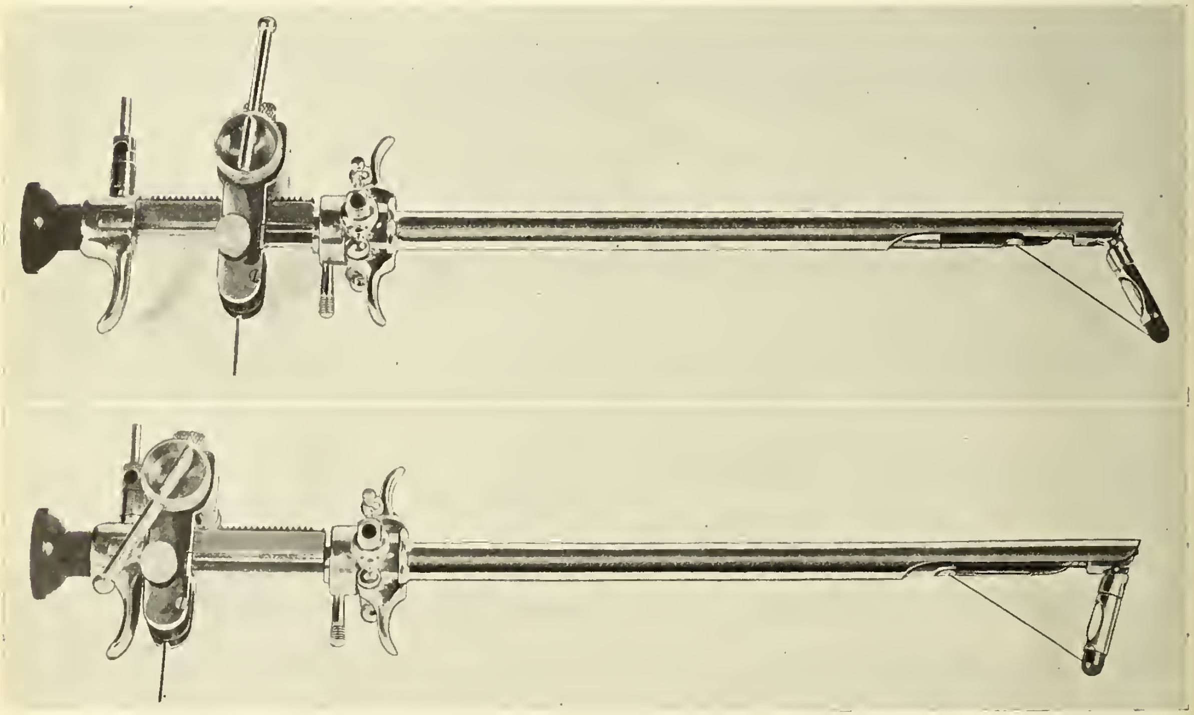

FIG. 12. NEW FOLEY PROSTATE EXCISOR: PHOTOGRAPHS OF THE WORKING ELEMENT AND SHEATH ASSEMBLED FOR OPERATION.
For description see text, pages 573 and 574.

the urethra the encroachment extends. The position of clefts between the lobes and their downward course and extent are carefully noted so that advantage may be taken of them in making the radial portions of the incision. The distance of the verumontanum below the vesical neck is accurately measured as the lower end of the cutting element must not be carried below this point.

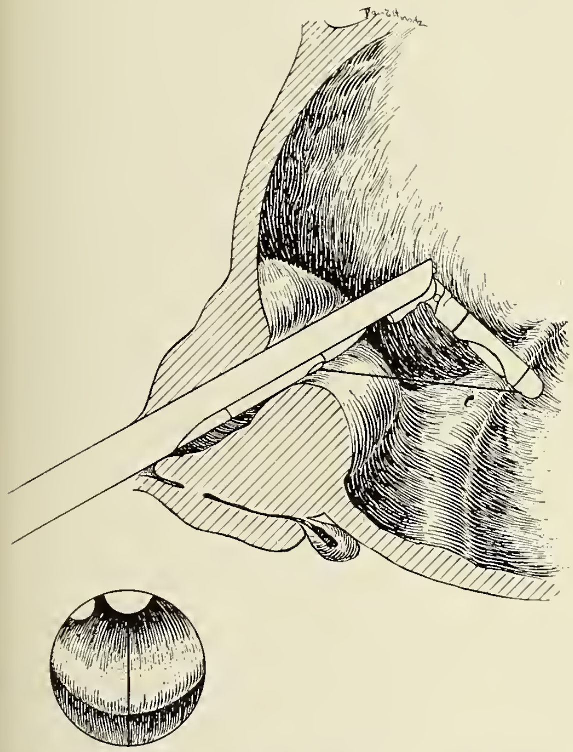

FIG. 13. CYSTOSCOPIC PROSTATECTOMY: NEW INSTRUMENT AND METHOD. PREPARATION FOR BEGINNING INCISION.

The sheath and working element within it are in position in the urethra ready for operation. The electrode conduit has been slid down the telescope carrying the lower end of the cutting element to a point ready to start a radial incision in the prostate. Traction by the electrode wire has tipped the deflecting arm and lamp over to brilliantly illuminate the vesical neck. The cystoscopic view of the vesical neck and projecting prostate and the relation of the electrode to them as seen in the retrograde telescope is shown in the insert. The cystoscopic field of such a telescope gives a mirror image of the object.

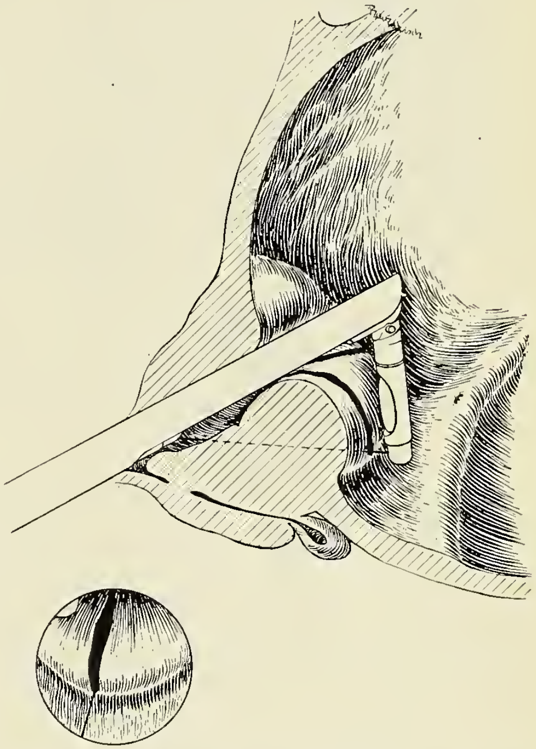

FIG. 14. CYSTOSCOPIC PROSTATECTOMY. NEW INSTRUMENT AND METHOD. RADIAL INCISIONS.

The position of the sheath and working element in the urethra has not been changed and is the same as shown in Figure 13. One radial incision has been made and a second is being completed. In making these incisions the electrode conduit is slid down the telescope from the position shown in Figure 13 to the point of maximal travel shown here. The lower end of the cutting element is thus carried down into the urethra, while its upper end is projected toward the periphery of the gland and its length cuts back into the gland. The cystoscopic view as seen in the retrograde telescope is shown in the insert. Note that the size and position of the projecting lobe appear just as they did in Figure 13; only the position of the electrode has been altered. The radial incision in the gland, extending from the urethra out to the peripheral part of the enlargement, is clearly seen.

From these observations it will be evident just what tissue it is necessary to remove to completely relieve obstruction and the exact method of procedure to be followed in making the excision will be pre-determined.

OPERATIVE TECHNIC

The method of making the excision is illustrated in the sketches Figures 13, 14 and 15.

The radial incisions are first made. In this process bleeding is controlled by alternating the cutting current with periods of coagulation. Particularly in the bottom of each incision should thorough coagulation be employed.

During operation of the electrode continuous “down draft” irrigation is employed; a brisk stream of fluid is supplied from the irrigating duct above the vesical neck with a continuous return flow down the urethra and through the sheath. This carries downward any bleeding from the incision and minimizes interference with vision by blood.

After making the radial incisions, and controlling the bleeding in each one, the sections of gland between them are cut away by rotating the whole instrument. In making this circular part of the excision the cutting element describes a conoidal surface of rotation.

Note that, except for their rotation in making the circular incision, the sheath and telescope remain in fixed position in relation to the vesical neck during the whole procedure and that the peripheral part of the enlarged gland is always in the visual field without change in magnification as would occur if there were alterations in the level of the objective lens above the vesical neck.

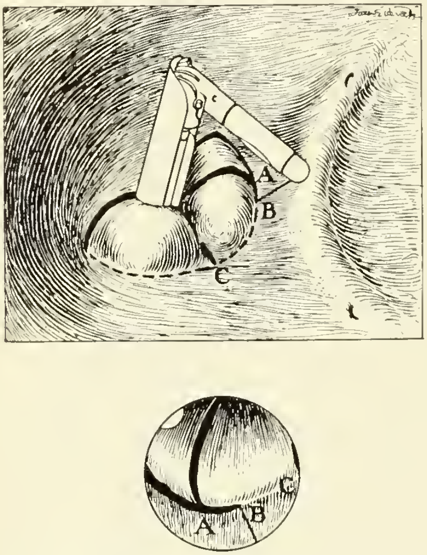

FIG. 15. CYSTOSCOPIC PROSTATECTOMY. NEW INSTRUMENT AND METHOD. ROTATING INCISION.

The radial incisions have been completed. The rotating incision is begun in the radial incision on the right side. It has progressed from this incision past the one next to it so that the block of tissue between the two is now completely severed from attachment. By further rotation of the instrument in the urethra, the incision will be completed as indicated along the dotted line. The cystoscopic view as seen in the retrograde telescope is shown in the insert. The letters serve to identify points in the mirror image.

From the cases thus far operated upon it appears that if bleeding in the radial incisions has been adequately controlled, only slight bleeding will occur from the circular or rotating incision.

The excised pieces of tissue are removed from the bladder with an accessory instrument referred to below.

Upon completion of the procedure an F26 catheter is fixed in the urethra.

ACCESSORY INSTRUMENTS

Additional means for control of bleeding is provided by another element consisting of a forobliquetelescope, fulgurating electrode and irrigating duct. This element is interchangeable with the working element in the sheath of the instrument. By removing the working element from the sheath it may be inserted for use at any time. Without the fulgurating tip it may be used for inspection within the urethra. A right angle vision telescope with light is also provided for use in the sheath for check-up examination and orientation whenever needed.

Thus far the excised pieces of tissue have been removed with a Young cystoscopic rongeur. This instrument is not operated in a sheath and accordingly passage and removal of it is required for each piece of tissue taken out of the bladder. The tissue, grasped in the jaws, is brought through the urethra without the protection of a sheath. In the case of large pieces (Fig. 16) this may be very undesirable.

For removing the excised pieces, Mr. Reinhold Wappler, The American Cystoscope Makers, Inc., is making a suitable grasping forceps to be operated in a sheath of the same calibre as that of the operating instrument.

COMMENT

In Figure 16 five pieces of gland from five different cases are shown. The one at the left was removed with the Stern instrument. The average weight of such pieces is about one-fourth of a gram. The next piece was removed with the McCarthy instrument. The average weight of such pieces is about one-third of a gram. The three large pieces were removed with the Foley excisor. The one at the right weighed six grams, which is the equivalent of 24 Stern pieces or 18 McCarthy pieces. Fortunately the urethra was unusually roomy and the tissue sufficiently soft and pliable to permit removal of this piece with the Young rongeur. Pieces of such dimensions should be broken up before removal.

The above comparison makes obvious only one of the advantages of the new instrument and method over the cutting current punches now in vogue. It may be summed up in the adage: *The usual method of cutting off a dog's tail has much to recommend it.*

In dealing with bars, contractures and small hypertrophies, not requiring extensive tissue removal, the new punch type instruments, particularly the McCarthy, are excellent though they have no advantage over the writer's new excisor even in such cases. They have, however, greatly extended the field and improved the technical facilities of the original punch principle.

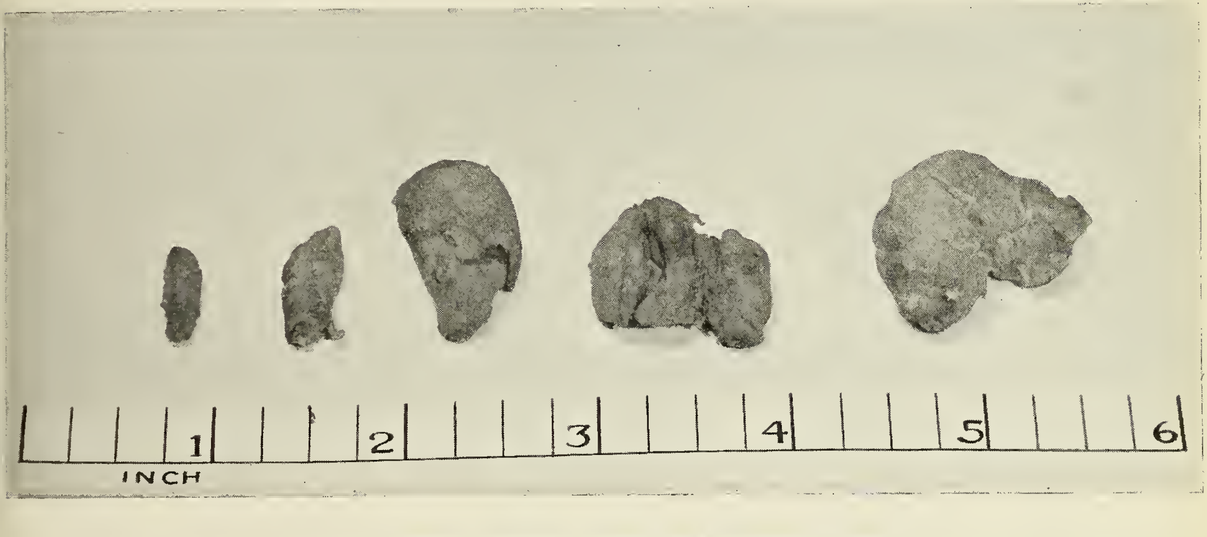

FIG. 16. PIECES OF PROSTATE FROM FIVE DIFFERENT CASES.

The small piece at the left was removed with the Stern instrument. The one next to it was removed with the McCarthy instrument. The three large pieces were removed with the Foley Excisor. The one at the extreme right represented almost the whole mid-lobe and weighed 6 gms. See text, page 576.

In cases of extensive enlargement the punch type instrument is at a considerable disadvantage. In the first place the projecting lobes at the vesical neck are seen only from the urethral side and appear in profile, while the extent of peripheral enlargement is only discovered after the tissue on the urethral side has been whittled away. If much tissue is to be removed this whittling process is time consuming and troublesome. With every punch cut, bleeding may be started anew and repeated applications of the coagulating current are thus required.

In cases in which the new instrument and method have been employed the procedure has gone with remarkable smoothness, rapidity, and accuracy of visual control. In no case has control of bleeding presented any difficulty and use of the hemostatic bag catheter, described with the original instrument,[11] has not been required. With few exceptions the convalescences have been uneventful and the functional results, thus far, have been excellent—large forceful streams, complete emptying of the bladder and relief of symptoms. A subsequent report will set forth full details of clinical experience including eventual end-results.

While the present "Further Report" is concerned entirely with the subjects of instrument design, construction and operative technic, and is not intended in any way as a report of clinical experience, it may be said at once that these methods of dealing with prostatic obstruction are here to stay and that it is only a question of determining from large clinical experience what few cases, if any, may require major surgery. The writer's experience, comprising only 32 cases, is entirely too limited for the drawing of conclusions. It is significant, however, that in the period covered by this experience, only two prostatectomies by ordinary methods of enucleation have been done, while the cases treated by transurethral methods have given immediate functional results as good, if not better than those obtained by enucleation. It is evident, therefore, that over 90 per cent of the cases of bladder neck obstruction encountered during this short period have been found satisfactorily amenable to minor transurethral surgery and presented no warrant for the hardship of a major operation. This is in essential accord with the experience of Davis,[7] and that of Alcock.[1]

The experience of Davis,[8] who has used the Stern cutting current punch continuously for four years, disposes of the misgiving that recurrence of obstruction is to be expected (at least within such a period) more frequently than with the ordinary type of major surgical removal.

The initial resistance on the part of some urologists, which at first found almost vehement expression, is on the wane and already many of them regard the procedure with favor, clinging only to the recommendation that it be not imposed in unsuitable cases. The new instrument and method described here remove many of the difficulties presented by the present punch instruments, in dealing with extensive enlargements requiring large tissue removals, and accordingly there remains only, a very small number of cases in which the method would be *imposed*.

The procedure makes demands on the best abilities of the skilled and experienced transurethral operator. In such hands it carries no unusual hazard and excellent results are regularly obtained. It is scarcely to be expected that the demands of the technic will be met by the casual cystoscopist or that, under such circumstances, the procedure will not be hazardous or that the results will be those attainable. Adverse criticism from such experience may be looked for but to the fair judge it can mean nothing. The large experience already had is ample proof that in competent hands these methods are eminently successful. The eventual and permanent appraisal of "The New Surgery of Prostatic Obstruction" can only be concerned with the results obtained in such hands. Accordingly upon the thoughtful practitioners who will make the final appraisal of these methods, it is incumbent to consider not only the content of reports but also the talents of the reporters.

Critics of this new enterprise express themselves as well satisfied with major prostatectomy, the hardships and economic loss of which are to be lightly passed over. This happy view is not shared by all competent and experienced urologic surgeons nor by many patients. Such critics must not be aware of their failures with prostate removal by major operation, for personal clinical contact with some of their cases of poor results has contributed somewhat to an inability to share their happy view of the open operation. Any surgeon of experience knows that major prostatectomy imposes suffering, anxiety, large risk to life, long convalescence, economic loss and financial hardship. Experience to date has satisfied those familiar with the new procedure that any competent cystoscopist who is willing to devote his talents and skill to these transurethral operations can thus adequately relieve a vast majority of prostatic obstructions and for him it is justified to impose major surgical removal in only a very limited and rapidly diminishing number of cases.

SUMMARY AND CONCLUSIONS

1. The ambitious purpose initiated by the writer in 1927 to make prostatectomy a relatively minor transurethral procedure has been brought to successful conclusion.

2. So-called transurethral prostatic resection with the punch instruments now in vogue has already proved that such methods should supplant major surgery in a large percentage of cases.

3. A new instrument and method representing a radical new departure from the punch principle is described: an electrode projected far beyond the sheath lumen, and operated under accurate visual control, permits rapid excision of practically any desired extent of the obstructing gland amounting in fact to "cystoscopic prostatectomy."

4. In the hands of the competent cystoscopist a vast majority of prostatic obstructions can be relieved by "cystoscopic prostatectomy" or by "transurethral prostatic resection" and, for him, removal of the gland by major operation is justified in only a very limited number of cases.

5. The time has come to speak in terms of what small percentage of cases will require major surgery rather than the percentage of cases in which transurethral methods can be imposed.

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A COMPARISON OF LESIONS ASSOCIATED WITH DUODENAL ULCER IN GERMANY AND IN THE UNITED STATES*

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and
Walter Sebening, M.D., *Frankfurt am Main, Germany*

BEFORE contrasting the lesions associated with duodenal ulcer in Germany and in the United States, it might be well to consider briefly the present-day treatment of duodenal ulcer in the United States.

There seems to be little doubt that, in the majority of cases, acute nonperforating duodenal ulcer with mild symptoms of short duration can be adequately controlled by proper maintenance of the relationship of diet, habits and the neutralization of gastric acidity. The patient with chronic duodenal ulcer, however, who has failed to respond to these methods of treatment and whose symptoms interfere with the proper carrying out of work or other activities, is best treated surgically. This, of course, includes patients with duodenal ulcers who have such complications as obstruction, hemorrhage and evidences of perforation. For chronic ulcers, therefore, the earlier a proper surgical procedure is carried out in indicated cases, the sooner patients can return to their usual occupations.

Many observers appear to believe that too much credit has been given to the so-called medical treatment of chronic duodenal ulcer. This has not been entirely the result of the enthusiasm of the internist and the gastro-enterologist. The tendency of surgeons in Germany to favor partial gastrectomy and its adoption by a few surgeons in this country as a routine procedure for all cases of duodenal ulcer without recognition of the variable pathologic changes, has obscured the fact that excellent results are obtained in 90 per cent of cases in this country in which conservative surgical procedures such as gastro-enterostomy or pyloroplasty with excision of the ulcer, are instituted. This is particularly true when the operative risk or mortality of gastro-enterostomy or pyloroplasty with excisions of ulcers is approximately 1 per cent. In considering the place of gastro-enterostomy in the treatment of duodenal ulcer, the figures obtained by the British Medical Association in an investigation in 2,609 cases, showed that the results of gastro-enterostomy were satisfactory in 89.5 per cent of cases. General improvement in health and well-being occurred in all but a few cases and secondary gastrojejunal ulcer occurred in only 2.8 per cent. Since these results are practically identical with those reported by Moynihan and by Walton in England, by Gosset in Paris, and by Balfour in the United States, it would seem that they can be accepted as standards of operative results.

Judd and Hazeltine reported satisfactory results in 90 per cent of cases in which excision of the ulcer with pyloroplasty was performed at The Mayo Clinic. They also stated that the risk of the operative procedure was less than 1 per cent, and that the operation is applicable in 50 per cent of cases of duodenal ulcer. Similar good results were reported by Finney and Hanrahan, in 251 cases in which pyloroplasty with excision of the ulcer was carried out. Satisfactory results were obtained in 86 per cent of the cases.

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*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, St. Paul, Minnesota, May 23 to 25, 1932.

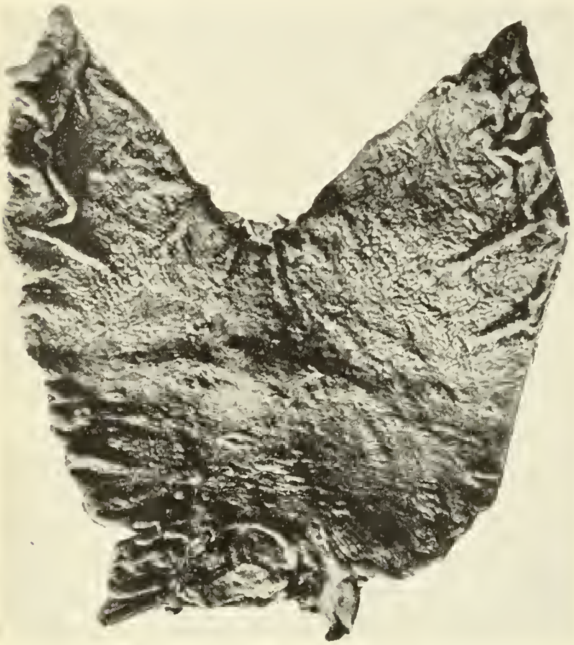

Fig. 1. Resected portion of stomach and duodenum showing ulcerative and hemorrhagic gastritis, associated with multiple duodenal ulcers (Schmieden Clinic).

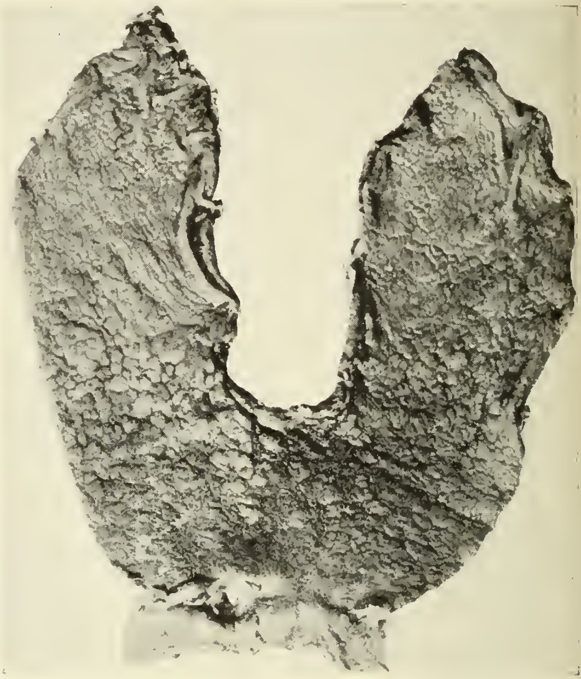

Fig. 2. Resected portion of stomach and duodenum showing hypertrophic gastritis with perforating duodenal ulcer (Schmieden Clinic).

On what basis, therefore, has gastric resection been accepted as a preferable procedure for the treatment of duodenal ulcer by surgeons in Germany? The answer is summarized in Konjetzney's report of ulcerative and hemorrhagic gastritis involving the antrum of the stomach, associated with duodenal ulcers in practically all cases in Germany, and by Sebening's observations that the ulcers seen in these cases in which operation is performed are more extensive, and are more frequently associated with chronic gastric ulcer (one to four in contrast with one to ten in The Mayo Clinic) and the higher incidence of recurring ulceration after gastro-enterostomy or pyloroplasty in Germany. Konjetzney believes that these inflammatory changes in the mucosa of the stomach are not secondary conditions of ulceration surrounding the ulcer, but are primary or parallel to the initial stage of duodenal ulceration. Substantiating his opinion that gastritis is a predisposing factor in the formation of ulcer he stated that in Germany this type of gastritis (with clinical symptoms of ulcer) occurs in cases without duodenal ulcer and that it involves the entire pyloric end of the stomach irrespective of the site of the ulcer.

The associated gastritis is, for the most part, of the ulcerative type and may or may not be associated with additional hemorrhagic areas of subacute and chronic inflammation (Fig. 1). The ulcers are more marked in the region of the lesser curvature, varying in number from a few to twenty or thirty and penetrating to the muscularis mucosa. Besides the ulcerative type of lesion, there is a hemorrhagic type accompanied in the early stages by hypertrophy of the mucous membrane (Fig. 2). Later this type appears to pass into the atrophic stage of gastritis. It is not uncommon to find the fibrinous exudate in the form of a white membrane spreading diffusely over the area of ulceration. In practically all cases, the areas of ulcerative gastritis are confined to the antrum or lower third of the stomach, whereas the area of hemorrhagic gastritis, although confined to the antrum, occasionally extends to the middle and upper third of the stomach. Microscopically, the lesions are characterized by typical areas of ulceration of the mucous membrane and covered in some cases by an exudate composed of fibrin and leukocytes. Marked leukocytic infiltration of all layers of the resected antrum of the stomach is noted. The duodenal ulcers themselves, for the most part, tend to be multiple and seem larger and more of the penetrating type than those generally observed in this country.

In April and May of 1931, Walters and Snell in visiting German surgical clinics, had an opportunity to study portions of the stomach and duodenum resected for duodenal ulceration and also specimens which had been removed previously. The constant occurrence of associated gastric lesions in clinics in Germany as described by Konjetzney was demonstrated. In discussing with surgeons in Germany these associated infectious lesions of the antrum of the stomach and mentioning their infrequency in association with duodenal ulcer as seen during operations at The Mayo Clinic, the question was raised as to whether at the time of operation for duodenal ulcer in which pyloroplasty or gastro-enterostomy was performed, one can inspect the antrum of the stomach sufficiently to determine with any degree of certainty that such associated gastric lesions were not present. We now have proof that similar types of gastritis are rarely present in cases in which operation is performed at the clinic. Furthermore, with these gastric lesions absent in a majority of our cases of duodenal ulcer, it would seem that not only pathologically but biologically, the lesions differ in the contrasting groups, hence surgical procedures directed toward cure in one group of cases may not be indicated in the other. Further differences between the types of peptic ulcers seen in The Mayo Clinic in comparison with those seen in clinics in Germany are evidenced by the fact that in the former the relation of gastric ulcers to duodenal ulcers is about one to ten. In Schmieden's clinic in Frankfurt, this relationship is one to four and in the reports of the surgeons in some of the other clinics in Germany, even one to one.

There is the possibility that this diffuse inflammation of the stomach, for the most part ulcerative, with its higher incidence among patients in Germany may explain the higher incidence of recurrence of ulceration following gastro-enterostomy or pyloroplasty in contrast to that found in this country. With subacute, hemorrhagic and ulcerative gastritis in the lower portion of the stomach, the stoma made at gastro-enterostomy or pyloroplasty is placed in the area of gastritis. Hence it would seem possible that the few cases in which ulcer recurs after gastro-enterostomy or pyloroplasty may be of this type, and that recurrence can be prevented if the few cases in which gastritis exists with duodenal ulceration are recognized and the ulcerating areas removed. Resection of the ulcerated portion of the stomach and duodenum has been carried out at The Mayo Clinic for many years when gastric and duodenal ulcers were associated.

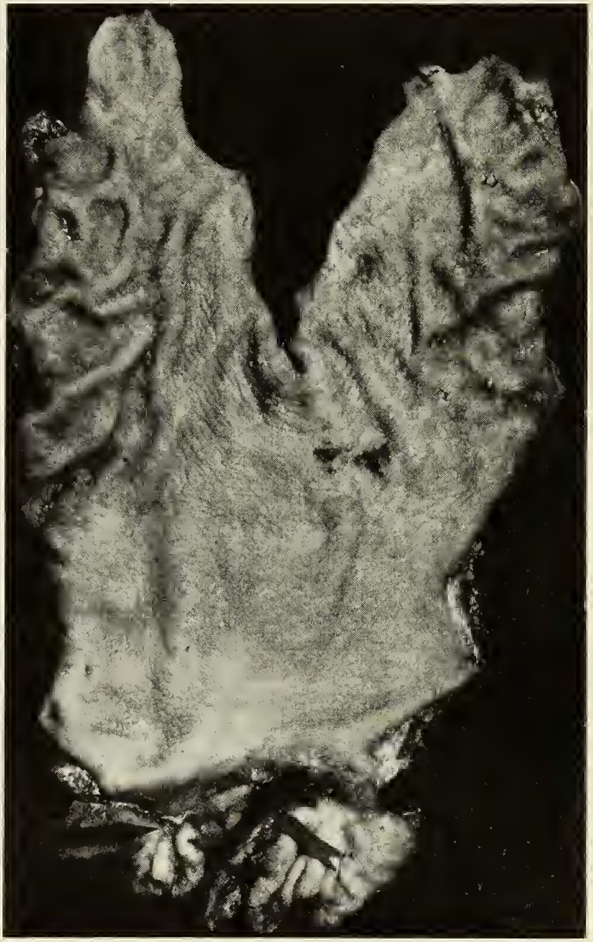

Fig. 3. Resected portion of stomach and duodenum showing perforating duodenal ulcer, penetrating contact duodenal ulcer; no gastritis (The Mayo Clinic).

Following the visit to Germany, the question of gastritis and duodenal ulcer was discussed with Balfour, MacCarty and Robertson, and it was decided that a detailed study would be made of the stomach and duodenum in cases of duodenal ulcer in which operation was performed. One of us (Walters) has, therefore, in the last ten months, performed gastric resections of the Billroth I and posterior Polya types for duodenal ulcer in cases in which the risk of the operation would not seem to mitigate against the recovery of the patients. Lesions chosen for resection were those of duodenal ulceration of the perforating, hemorrhagic and obstructing types (Figs. 3 and 4). In only two of the specimens was gastritis associated; in one of them, the presence of the gastric ulcerations had been demonstrated in roentgenograms prior to operation (Fig. 5); in the other, the presence of the ulcerative gastritis was evidenced by the unusual thickening and congestion of the lower portion of the stomach to palpation and inspection. This patient had had two severe hemorrhages from the ulcer or ulcers. In both cases, necessity for gastric and duodenal resection was apparent because of the multiplicity of the lesions. With the exception of these two cases, there was no evidence of either the ulcerative or hemorrhagic type of gastritis associated with duodenal ulcer.

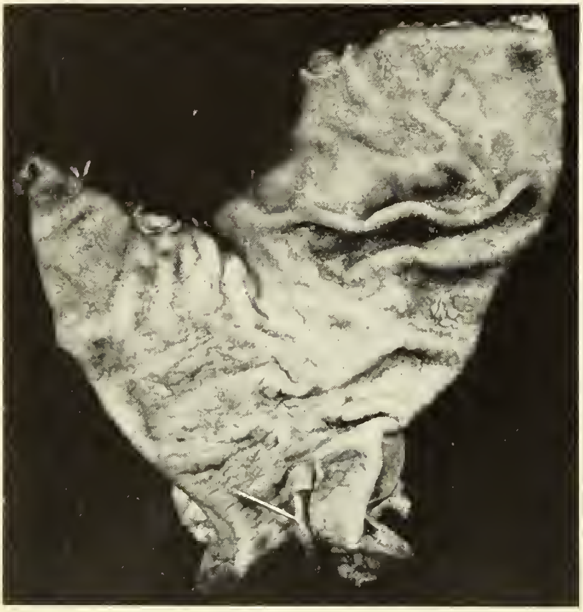

Fig. 4. Resected portion of stomach and duodenum showing duodenal ulcer; no gastritis (The Mayo Clinic).

In two other cases in which resections of the stomach were done for gastrojejunal ulcer, gastritis was evidenced, in one case by a superficial gastric ulcer, and in the other, in which a recurring, obstructing duodenal ulcer had developed after pyloroplasty, ulcerative gastritis was demonstrated in the resected portion of the stomach.

That essential differences in other types of lesions exist in different countries, or indeed in different parts of the same country, is apparent when one studies the distribution of cases of enlargement of the thyroid gland, and recalls the so-called goiter belts in this country, in which the thyroid gland is excessively enlarged, and the variable geographic incidence of associated hyperthyroidism. In Germany, in the mountainous regions near the source of the Rhine, there are said to be only a few cases of exophthalmic goiter, which is in direct contrast to the proportion of goiter existing in the northern provinces of Germany along the same river. Certain surgeons have noticed that there is a marked difference in the types of duodenal ulcer and the degree of associated gastritis in two cities along the Rhine only sixty miles apart. Further evidence of the geographic variability, possibly associated with changes of metabolism, is the increasing development of calculi in the urinary tract which has occurred in almost geometric progression in some parts of Germany in the last ten years. For the most part, the urinary calculi exist without urinary infection, and the similarity of their percentage of development in relation to that of exophthalmic goiter in the various provinces around the Rhine, as noted by Braun, is striking in that where exophthalmic goiter has been infrequent in appearance, so have urinary calculi been infrequent. This geographic variability is more striking when one considers that in both exophthalmic goiter and duodenal ulcer the lesions are accompanied by oversecretion. Further, during this

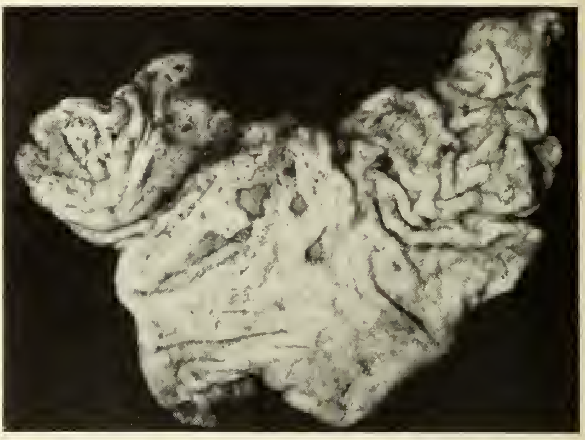

Fig. 5. Resected portion of stomach and duodenum showing ulcerative gastritis (The Mayo Clinic).

same period of ten years, there has been an alarming increase in the proportion of fatal postoperative pulmonary emboli in Germany; this increase has not occurred in some of the surgical clinics in Paris with which I am acquainted, nor has it occurred in the clinics in the United States. It may be that the incidence of postoperative pulmonary embolism has a distinct relationship to metabolism, and the recent work of Bancroft and Stanley-Brown would seem to indicate that a diet high in protein tends to increase the clotting time of the blood. These facts, I believe, will add additional weight to the argument that the lesions associated with duodenal ulcer vary pathologically and probably biologically in different localities and among different people, and that surgical procedures directed toward the treatment of one group of cases may not be indicated in the other.

It should be remembered, furthermore, that the average risk of partial gastrectomy, including partial duodenectomy, varies from 5 to 10 per cent in the hands of skillful and experienced surgeons, and this risk increases proportionately from 13 to 15 per cent, as reported from one of the European clinics, depending on the size, fixation and degree of penetration and the extent of the resection of the duodenum necessary to remove it. On the other hand, the infrequency with which such accompanying inflammations in the stomach have been present in cases in which operation had been performed at The Mayo Clinic had led to the belief that in most cases in which operation is performed, excellent results can be expected by gastro-enterostomy or pyloroplasty with excision of the ulcers. These procedures can be carried out with a risk of 1 per cent or less. Should associated inflammatory changes and ulcerations exist in the stomach in connection with duodenal ulcer, it would seem to indicate a place for removal of these ulcerating areas; this applies particularly to the bleeding type of ulcer.

SUMMARY

Portions of the stomach and duodenum, resected for duodenal ulceration, in some of the surgical clinics in Germany, are contrasted with specimens removed at The Mayo Clinic. In the lesions removed in Germany, marked gastritis was found. These lesions are for the most part ulcerative, are confined to the antrum of the stomach, and may or may not be associated with hemorrhagic gastritis and hypertrophy or atrophy of the mucous membrance. Konjetzney found gastritis to be an accompaniment of duodenal ulcer in practically all such resected specimens. In a study of the antrum of the stomach in cases of duodenal ulcer in which operation was performed at The Mayo Clinic the very rare association of gastritis was noted, evidence being presented by specimens removed at the time of operation.

It appears, therefore, that the lesions in the two countries differ, not only pathologically, but biologically, hence the surgical procedures directed toward the treatment of one group of cases may not be indicated in the other. The probabilities are that the gastritis associated with duodenal ulcer in Germany accounts for the higher incidence of recurrence of ulceration following the conservative operations of gastro-enterostomy and pyloroplasty, in contrast to the low incidence of recurrence in this country. It would seem possible that the explanation for the development of recurring ulcer in the few cases (approximately 2.5 per cent) after gastro-enterostomy and pyloroplasty, might be the association of inflammatory changes in the stomach. This small incidence of recurrence might be prevented if such cases were distinguished from those in which ulcerative gastritis is not associated. In two of our cases, associated ulcerating lesions of the stomach were known to exist. In one case they were demonstrated roentgenologically, and in the other there was palpable evidence of thickening and congestion in the lower end of the stomach. In substantiating the idea that variability in pathologic lesions exists in different geographic regions, attention is directed to the variability in the incidence of toxic goiter, urinary calculi and postoperative pulmonary emboli in different countries.

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IMPORTANT POINTS IN THE SURGERY OF THE DISEASED THYROID*

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Minneapolis

GOITER operations are based on one of two principles: either the surgeon follows no special plan, excising the goiter as he would any other tumor and ligating the blood vessels as they bleed, or he follows methodically a definite procedure based on the anatomy of the thyroid and its related structures. With either method, the immediate result of the operation appears to be the same. The operative mortality in thyroid surgery, the main factors in which are the condition of the heart and kidneys, or some constitutional disorder, is scarcely one per cent.

However, something beyond the operative mortality enters into the question, namely, a cosmetic and functional result and the avoidance of complications. The most frequent technical complications in the surgical management of goiter are, injury to the laryngeal nerves, injury to the parathyroid bodies and hemorrhage.

It will be the purpose of this paper to show that these accidents can best be avoided by a careful technic, based on detailed attention to the anatomy involved.

SURGICAL ANATOMY OF THE THYROID

The surgical anatomy of the thyroid is concerned mainly with the blood supply, because in the surgical treatment of the diseased thyroid gland, injury to the laryngeal nerves and parathyroids occurs probably most often in the attempt to apply ligatures to the thyroid arteries and in the control of hemorrhage within the capsule. Therefore, a brief review of the anatomy involved in thyroidectomy, will be helpful. The sketches shown were made from our dissections.

Figure 1 shows the extralaryngeal relations of the superior pole of the thyroid gland. Insert C shows the close proximity of the superior thyroid artery to the superior laryngeal nerve and demonstrates the possibility of injury to this nerve in the attempt to ligate the superior thyroid artery in the course of the operation.

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*Presented at the annual meeting of the Minnesota State Medical Association, Saint Paul, May 25, 1932.

Figure 2 shows a dissection of the left side of the neck and demonstrates the anatomical relations of the left recurrent laryngeal nerve and the inferior thyroid artery. Injury to this nerve might be sustained during the mere delivery of a substernal enlargement of the left lobe of the thyroid, or an intrathoracic goiter, because the left recurrent nerve curves over the arch of the aorta. From this dissection, as well as that in Figure 3, it is evident that the nerve might also be injured in the attempt to grasp bleeding branches of the inferior thyroid artery. The nerve passes between the branches of the artery within the capsule of the gland.

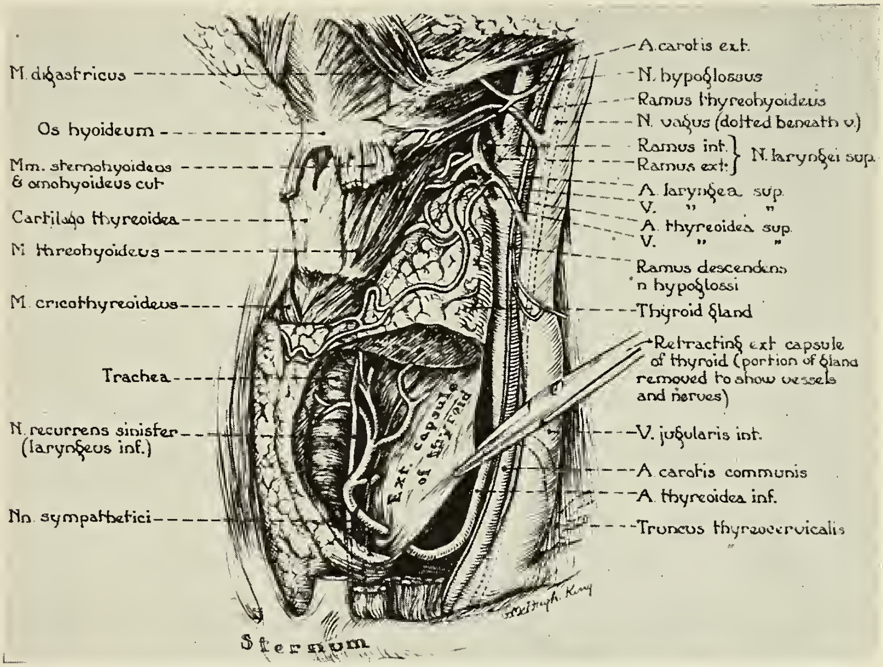

M. digastricus
Os hyoideum
Mm. sternohyoideus & omohyoideus cut
Cartilago thyreoidea
M. threohyoideus
M. cricothyreoideus
Trachea
N. recurrens sinister (laryngeus inf.)
Nn. sympathetici
Sternum
A. carotis ext.
N. hypoglossus
Ramus thyreohyoideus
N. vagus (dotted beneath v.)
Ramus int.
Ramus ext.
N. laryngei sup.
A. laryngea sup.
V. " "
A. thyreoidea sup.
V. " "
Ramus descendens n. hypoglossi
Thyroid gland
Retracting ext capsule of thyroid (portion of gland removed to show vessels and nerves)
Ext. capsule of thyroid
V. jugularis int.
A. carotis communis
A. thyreoidea inf.
Truncus thyreocervicalis

Fig. 1. Dissection of the right side of neck, to show the relations of the superior thyroid artery to the upper pole, together with the tracheal relation of the recurrent laryngeal nerve.

Figure 4 demonstrates the course of the inferior thyroid arteries and their relation to the recurrent laryngeal nerves, as well as to the parathyroid bodies. As indicated in the drawing, and proved through investigation of Enderlin and Hotz, Halsted, Mastin, Wangensteen and others, the parathyroids receive their blood supply from a fine branch of the inferior thyroid artery, or by a branch artery, connecting the inferior with the superior thyroid artery. Clinically, therefore, if ligation of the inferior thyroid artery is contemplated, the ligature should be applied as far away as possible from the terminal branches to permit good collateral circulation to these structures. With these anatomical facts in mind, we will proceed to the actual operation.

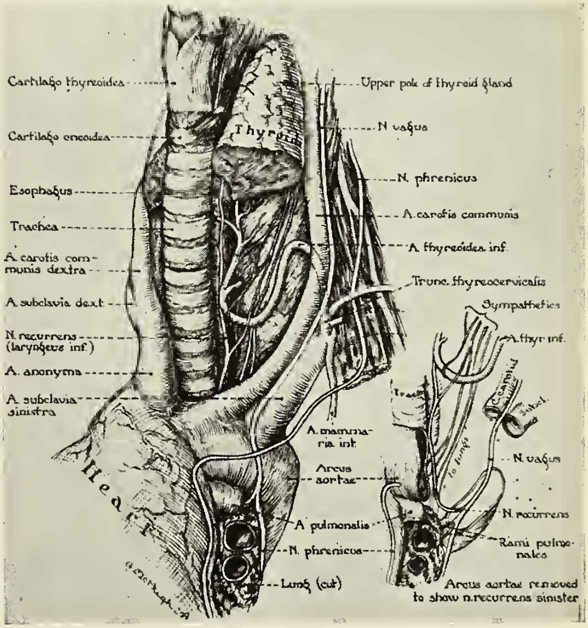

Cartilago thyreoidea
Cartilago cricoidea
Esophagus
Trachea
A. carotis communis dextra
A. subclavia dext.
N. recurrens (laryngeus inf.)
A. anonyma
A. subclavia sinistra
Heart
Thyroid
Upper pole of thyroid gland
N vagus
N. phrenicus
A. carotis communis
A. thyreoidea inf.
Trunc. thyreocervicalis
Sympathetics
A. thyr inf.
C. carotid
Subcl.
Trach.
to lungs
A. mammaria int.
Arcus aortae
N. vagus
N. recurrens
A. pulmonalis
Rami pulmonales
N. phrenicus
Lung (cut)
Arcus aortae removed to show n. recurrens sinister

Fig. 2. Dissection of the left side of neck, to show the anatomical relations of the left recurrent laryngeal nerve and inferior thyroid artery.

THE OPERATION

Only the points relevant to the subject matter will be discussed, namely, the diagnosis, the anesthesia, the position of the patient, special instruments, the incision, efficient hemostasis, drainage, and closure of the wound.

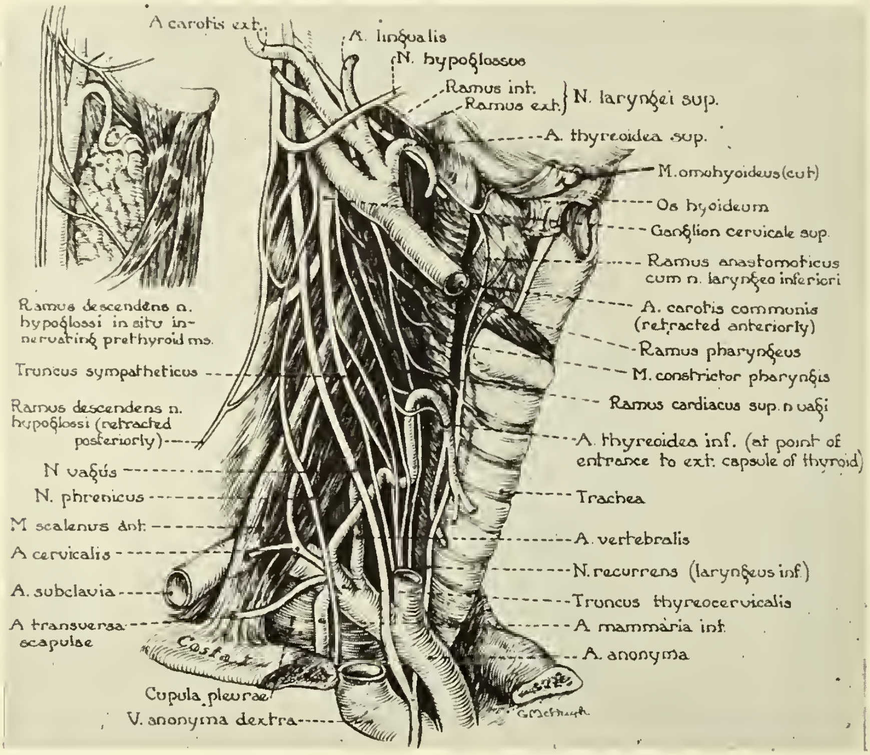

A carotis ext.
A. lingualis
N. hypoglossus
Ramus int.
Ramus ext.
N. laryngei sup.
A. thyreoidea sup.
M. omohyoideus (cut)
Os hyoideum
Ganglion cervicale sup.
Ramus anastomoticus cum n. laryngeo inferiori
A. carotis communis (retracted anteriorly)
Ramus pharyngeus
M. constrictor pharyngis
Ramus cardiacus sup. n vagi
A. thyreoidea inf. (at point of entrance to ext. capsule of thyroid)
Trachea
A. vertebralis
N. recurrens (laryngeus inf.)
Truncus thyreocervicalis
A mammaria int.
A. anonyma
Ramus descendens n. hypoglossi in situ innervating prethyroid ms.
Truncus sympatheticus
Ramus descendens n. hypoglossi (retracted posteriorly)
N vagus
N. phrenicus
M scalenus ant.
A cervicalis
A. subclavia
A transversa scapulae
Costa I
Cupula pleurae
V. anonyma dextra
G McHugh

Fig. 3. Dissection of the neck, left side, to show the relations of the laryngeal nerves, thyroid arteries and capsule of the gland.

The diagnosis of the thyroid disturbance determines the choice of the operative procedure. The method of surgical attack might vary, according to the presence of:

(1) Diffuse goiter
   (hyperthyroidism, with or without exophthalmos)
(2) Nodular goiter
   (toxic or non-toxic)
   (a) Preoperative affections of the laryngeal nerves.
   (b) Deviation of the trachea.

In the surgical treatment of hyperthyroidism, application of ligatures to the thyroid vessels plays an important part. This is particularly true in the surgical management of hyperthyroidism in children. Hyperthyroid patients under fifteen years of age are particularly sensitive to surgical operations. They do not respond to Lugol's treatment as well as the adult, and the basal metabolic determination cannot be depended upon as accurately as in the adult. In children, we make a preliminary ligation of the two superior thyroid arteries, one week apart, followed by excision of the gland, two or three months later.

From our experience, which corresponds to the opinion of Reinhoff, we find about 5 per cent of all adults with hyperthroidism (without adenoma) do not respond to the treatment with Lugol's solution. This group must also be treated with preliminary ligation of the superior thyroid vessels. The operation of preliminary ligation of the superior thyroid artery is simple and is performed as originally described by Kocher (Fig. 5).

Preoperative affections of the laryngeal nerves, according to Reinhoff, occur in from 5 to 10 per cent of all simple goiters. In malignant goiters, the incidence is much higher. Preliminary laryngoscopic examination is very important in all cases of goiter, but especially so before operation on the large nodular goiter. The percentage of operative injuries to the recurrent laryngeal nerve varies from 1 to 5 per cent, and depends to a great extent on the type of the case and the technic employed. Obviously, it is important to know if preoperative cord paralysis exists and to know which cord is affected.

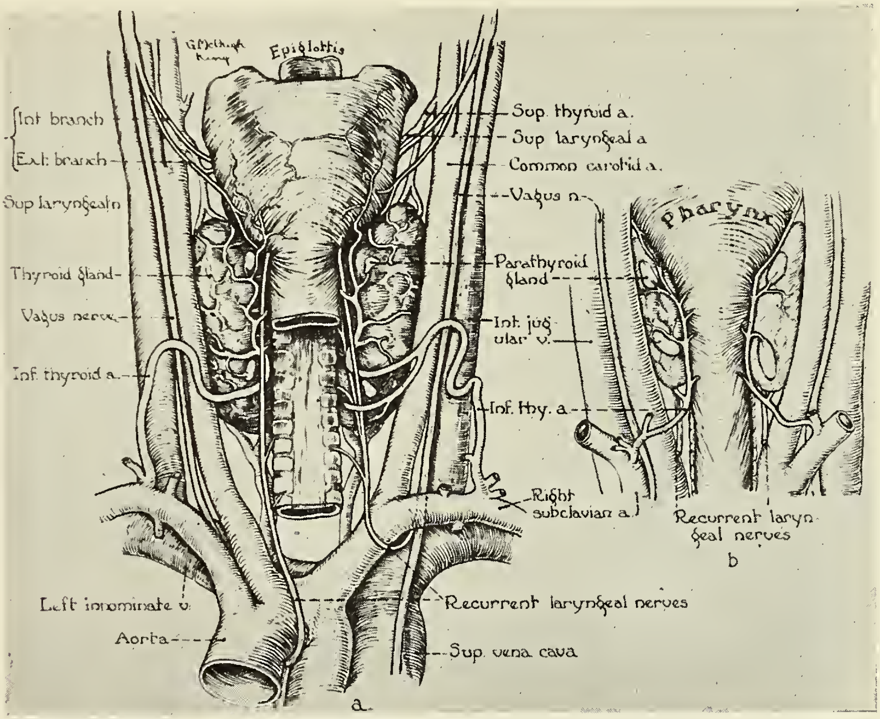

Epiglottis
Int branch
Ext. branch
Sup laryngeal n
Thyroid gland
Vagus nerve
Inf. thyroid a.
Sup. thyroid a.
Sup laryngeal a
Common carotid a.
Vagus n.
Parathyroid gland
Int. jugular v.
Inf. thy. a.
Right subclavian a.
Pharynx
Recurrent laryngeal nerves
b
Left innominate v.
Aorta
Recurrent laryngeal nerves
Sup. vena cava
a.

Fig. 4. Posterior view of the larynx and trachea, to show the anatomical relations of the laryngeal nerves to the thyroid arteries and parathyroids.

Deviation of the trachea is quite common in patients with nodular goiters, particularly in those with extreme enlargement of one lobe (Fig. 6). An X-ray examination of the neck and upper chest is, therefore, very important. Accidental injury to the trachea, as well as injury to the laryngeal nerves will often be avoided with this precaution.

The anesthesia to be used in the surgery of the thyroid has been much discussed. We find gas (nitrous oxide or ethylene) the ideal anesthetic for patients with marked hyperthyroidism. Nervousness in the patient is thus avoided and better relaxation of the patient is obtained. With the elimination of the psychic factor, we are better able to judge the condition of the patient, as indicated by the pulse rate, and thus to determine the extent of the operation. Local anesthesia or gas or a combination of both may be used in the non-toxic cases.

The position of the patient, during the operation (Fig. 7) is a matter of great importance. The head must be well extended backwards, but should be limited to the articulations of the upper vertebræ. This posture is indispensable in most patients with large goiters and makes the operation simpler and safer.

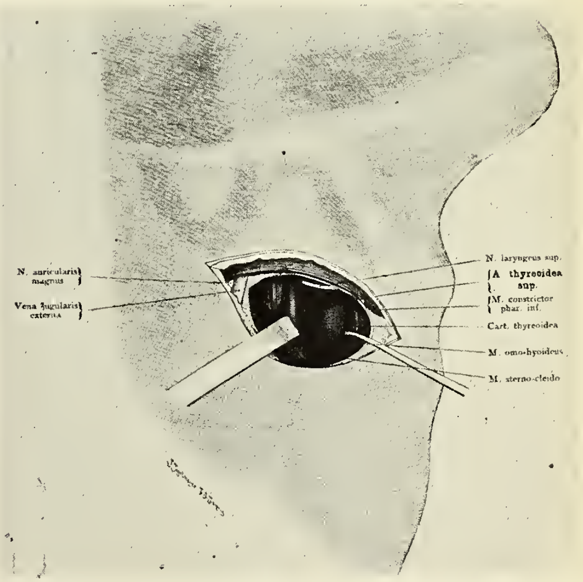
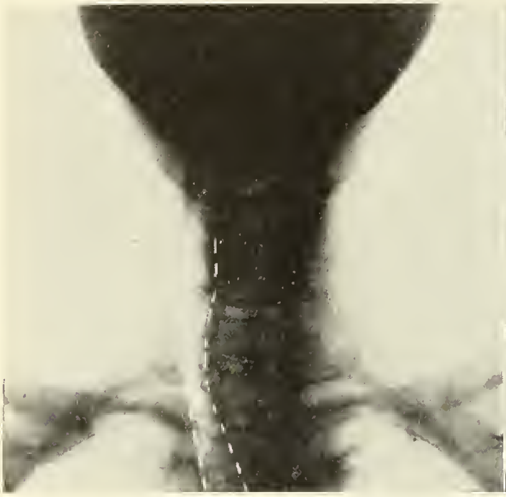

N. auricularis magnus
Vena jugularis externa
N. laryngeus sup.
A. thyreoidea sup.
M. constrictor phar. inf.
Cart. thyreoidea
M. omo-hyoideus
M. sterno-cleido

Fig. 5. Ligature of the superior thyroid artery. (From Kocher.)

Special instruments for goiter operations become more important as the operator attempts to save small muscles and to make preliminary ligations of the blood vessels. Unless appropriate retractors are employed, it is useless to attempt primary ligature of the inferior thyroid artery. A self-retaining retractor, ligature carriers and grasping forceps are very important (Fig. 8).

The incision should be relatively straight and in cases of ordinary sized goiters should be placed about one finger-breadth above the upper border of the mesial ends of the clavicles. The larger the goiter, the higher the incision should be, because, with the excess of loose skin, the scar has a tendency to drop onto the upper chest. We include the superficial layer of the deep cervical fascia in our incision and this layer, together with the anterior jugular veins, is dissected back with the anterior flap (Fig. 9). The prethyroid muscles are thus exposed and, without their fascial investment, they can readily be retracted without cutting. As a further advantage of this deeper incision, ecchymosis in the flap is prevented in the thin patient.

Efficient hemostasis is most important in thyroid surgery. For better hemostasis and because of the greater safety to the recurrent laryngeal nerves and the parathyroids, we apply a ligature to the inferior thyroid artery, extrafascially, before proceeding to the excision of the gland. We always ligate one inferior thyroid artery and both superiors in non-toxic and mildly toxic cases. We ligate all four arteries in severely toxic cases. Pemberton states that he now ligates one or both inferior thyroid arteries in about 90 per cent of all thyroidectomies.



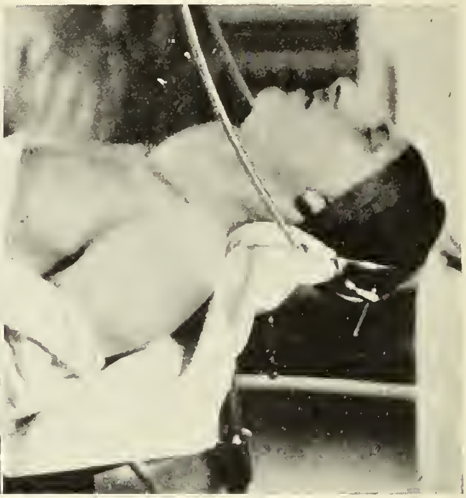


Fig. 6 *(left)*. Showing marked deviations of the trachea in large goiter.
Fig. 7 *(right)*. Showing the extension of the head for thyroidectomy.

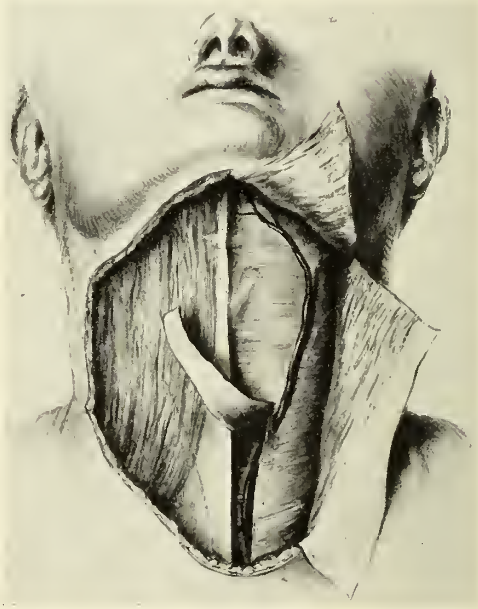


Fig. 9. Dissection showing the oblique passage of the anterior jugular vein through the deep cervical fascia.

The technic of extrafascial ligation of the inferior thyroid artery is as follows: After the usual incision, the median border of the sternomastoid muscle is liberated and drawn outward with a blunt retractor. The exposed fascia of the prethyroid muscle is now slit vertically about 3 cm. in extent. The outer edge is pared back gently and the finger is easily slipped down to the transverse processes of the vertebra, mesial to the carotid sheath. The inferior thyroid artery is felt at the level of the sixth cervical vertebra, (usually marked by a small tubercle) as it emerges at right angles to the carotid vessels. With retractors properly placed, the artery is easily ligated (with linen). (Figs. 10 and 11.)

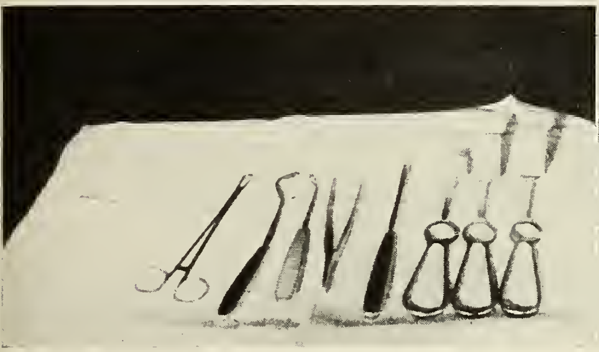


Fig. 8. Instruments necessary for primary ligature of inferior thyroid artery.

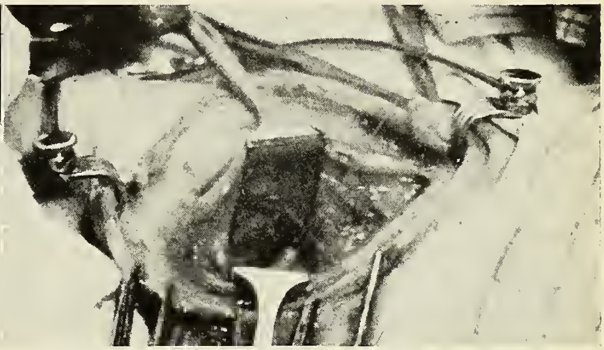


Fig. 10. Primary extrafascial exposure, and application of ligature to the inferior thyroid artery in thyroidectomy.

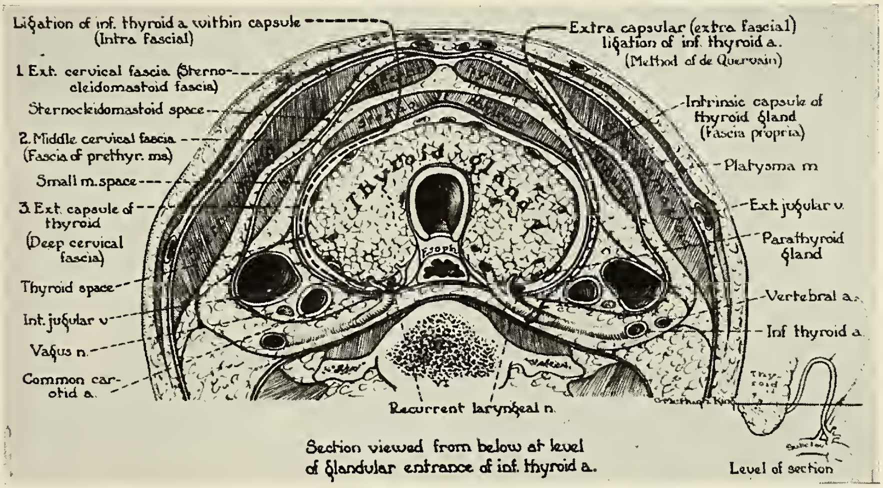

Ligation of inf. thyroid a. within capsule (Intra fascial)
1. Ext. cervical fascia (Sterno-cleidomastoid fascia)
Sternocleidomastoid space
2. Middle cervical fascia (Fascia of prethyr. ms)
Small m. space
3. Ext. capsule of thyroid (Deep cervical fascia)
Thyroid space
Int. jugular v.
Vagus n.
Common carotid a.
Extra capsular (extra fascial) ligation of inf. thyroid a. (Method of de Quervain)
Intrinsic capsule of thyroid gland (Fascia propria)
Platysma m
Ext. jugular v.
Parathyroid gland
Vertebral a.
Inf thyroid a.
Thyroid gland
Esoph
Recurrent laryngeal n.
Thyroid
Section viewed from below at level of glandular entrance of inf. thyroid a.
Level of section

Fig. 11. Transverse section of the neck viewed from below to illustrate clinical application of ligatures to the inferior thyroid artery, based on the anatomical relations.

Ligation of the superior pole, in thyroidectomy, is easily performed with good exposure. After separation of the prethyroid muscles, we expose the upper pole and ligate en masse. Linen is used in toxic cases. The ligature must pass around the whole pole and not through it. This is best accomplished by passing the ligature from within outward, with curved forceps or a special ligature carrier (Fig. 8). Polar ligation will more often avoid accident to the superior laryngeal nerve than ultra ligation (Fig. 1). Goetsch, in a study of the histological changes in the arteries in patients with hyperthyroidism, found parathyroid bodies often on the superior thyroid vessels. Besides preserving these glands, it will also permit preservation of the healthiest part of the gland in the non-toxic cases.

After the preliminary ligation of the arteries, as described, the actual excision of the lobe is now performed with very little bleeding, thereby protecting the parathyroids and the laryngeal nerves. Because of the mesial relation of the recurrent laryngeal nerve to the gland (Figs. 2 and 3), excision is carried from within outward, preserving the postero-mesial portion. This more definitely protects the nerve.

Drainage should be used in all thyroidectomies. Drainage of the flap is more important than drainage of the thyroid space. If it is not performed primarily, it will be necessary later. The tubes may be removed any time after twenty-four hours. In substernal and intrathoracic goiters, the tube should be kept in place three to six days, to avoid mediastinitis. To avoid "tracheal tug" lateral drainage is the method of choice.

Closure of the wound is made with interrupted No. 1 plain catgut sutures in the capsule of the gland and for uniting the edges of the prethyroid muscles. The incision in the fascia is repaired in the same manner. The skin is closed with clips and dermal. For a good scar (a very important part of the operation) the clips and dermal should be removed early.

CONCLUSIONS

Surgery of the thyroid is very safe when the operator is adequately informed and takes proper precautions. Adequate knowledge of the anatomy and proper hemostasis make possible a neat, clean, practical operation, offering protection to the laryngeal nerves and parathyroid bodies. Proper hemostasis prevents postoperative hemorrhage and makes less drainage, more rapid convalescence, a better scar and a greater chance of a permanent cure.

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EXTRA-UTERINE PREGNANCY*

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It is our carefully considered opinion that far too often, extra-uterine pregnancies are not diagnosed early enough to give the patient the best possible chance for recovery. When we consider that the mortality ranges from 2 to 6 per cent, we cannot fail to recognize the importance of an early diagnosis. In this report of fifty-three cases, we had one death, which we feel could have been avoided, had the patient come to us before severe peritonitis had set in. Another patient seen in consultation had a leukocyte count of 45,500, which is the highest we have seen, and this woman also, needlessly, passed into the "Great Beyond." In this paper, we shall try to interest the profession in the making of an earlier diagnosis of extra-uterine pregnancy, and in this way try to do our share in contributing to the lessening of the mortality from this all too common source.

In this type of pregnancy the fertilized ovum becomes implanted at some point in its path between the ovary and the uterus, and in the great majority of cases it is arrested in some portion of the Fallopian tube. Thus it may be implanted in the ampulla, isthmus or very rarely in the portion passing through the uterine cornu—designated interstitial pregnancy. It may also occur in the horn of a bicornate uterus. Primary abdominal pregnancy is reported, though it must be exceedingly rare, and the question must be considered as to whether or not such a condition is not the result of an extruded tubal pregnancy. Litzenberg does not believe primary abdominal pregnancy can occur.

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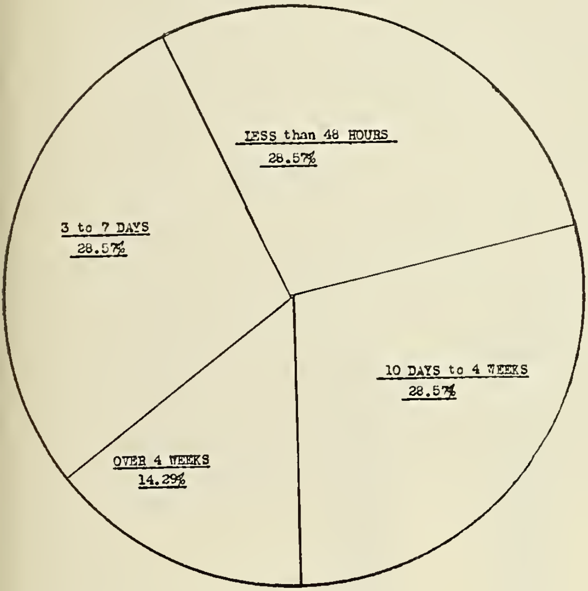
*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 24, 1932.

TIME ELAPSED FROM ONSET OF SYMPTOMS UNTIL PATIENT CONSULTED SURGEON GROUPED BY CONVENIENT CLASSES AND SHOWN BY PERCENTAGES



The varieties and results of ectopic or extra-uterine pregnancy may according to Lea be tabulated as follows:

I. *Ovarian Pregnancy:* Sac develops in substance of ovary, usually with early rupture.

II. *Tubal Gestation:* In the (1) isthmus; (2) ampulla; (3) accessory Fallopian tube (rare); fimbria (rare).

A. At times it progresses in the Fallopian tube to advanced stage of pregnancy without rupture, but this is very rare.

B. Intra-peritoneal rupture, most common, results in:

1. Death from profuse bleeding;

2. Hematocele, which may undergo

a. Absorption,

b. Suppuration.

3. Fetus may develop in peritoneal cavity, placenta remaining in tube (secondary abdominal pregnancy). May go to full term, or sac may rupture at any time. Fetus may undergo secondary changes as: a. mummification; b. adiopocere; c. calcification; d. suppuration.

C. Tubal abortion. Expulsion through abdominal ostium may result before occlusion occurs, *i.e.,* before eight weeks, may persist as a tubal mole and is of two types:

1. Complete expulsion known as hematocele.

2. Incomplete with recurrent intra-peritoneal hemorrhage: often fatal.

D. Hematosalpinx. Death of embryo with rupture; tube filled with blood clot may become infected—pyosalpinx.

E. Rupture Into Broad Ligament.

1. May continue to develop till term, as an intraligamentous pregnancy.

2. May develop for a time and then "secondary" rupture into peritoneum occurs.

3. May form a hematoma, following death of fetus, and results in: a. absorption; b. suppuration.

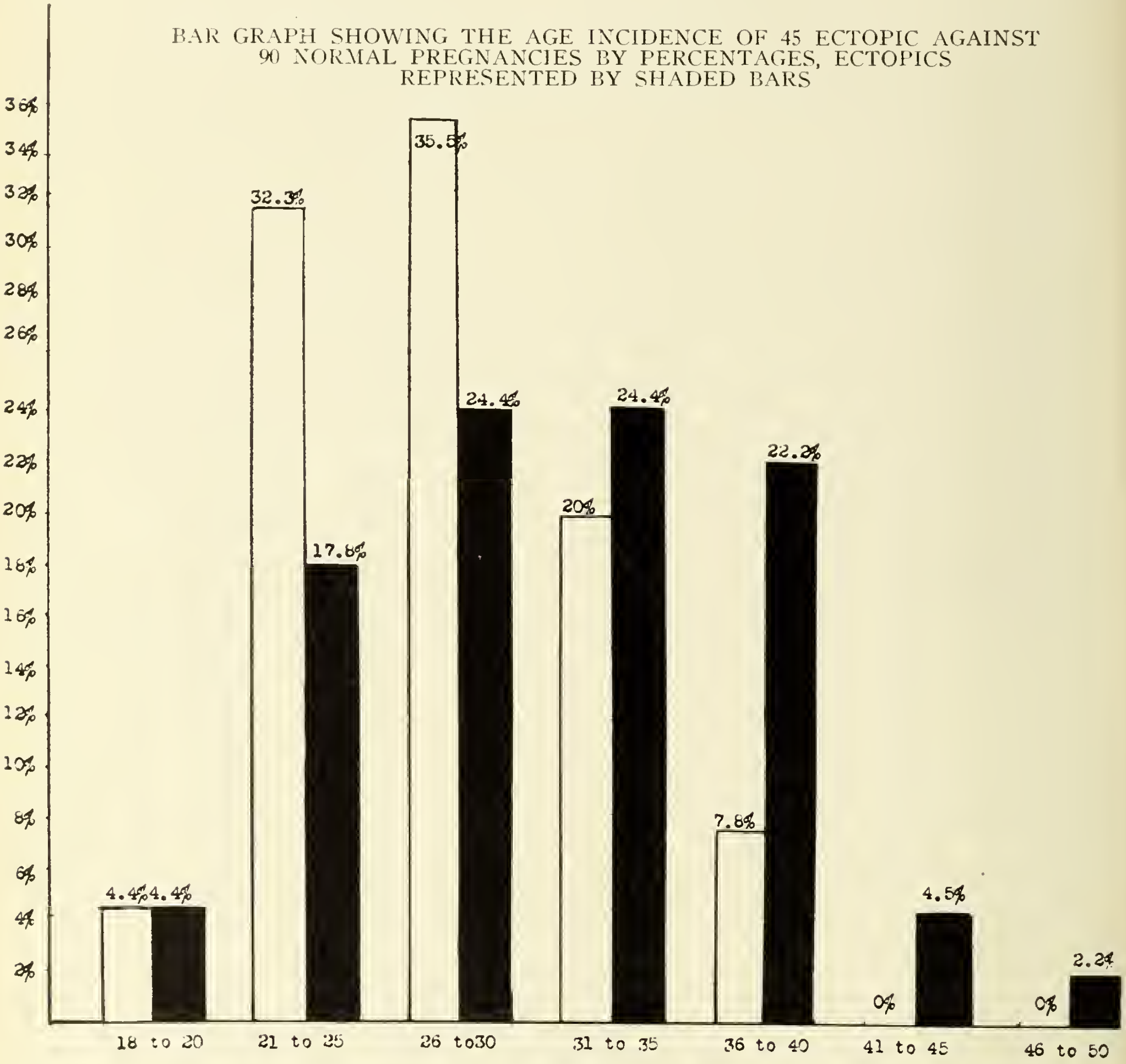
4. Suppuration of gestation sac. Rupture may occur into: a. bowel; b. bladder; c. vagina; d. abdominal wall.

III. *Interstital Pregnancy.* Develops in portion of tube in uterine wall. Sac ruptures fourth month of pregnancy into: a. peritoneal cavity (may be fatal from hemorrhage); b. uterine cavity (rare).

IV. *Cornual Pregnancy.* This is rare and ends in intra-peritoneal rupture after third month.

V. *Primary Abdominal Pregnancy.* This is very rare.

Inasmuch as extra-uterine pregnancy is a disease occuring in the child-bearing period, its age incidence is necessarily limited (Graph I). In our own cases, we found 45 per cent occurring in the fourth decade and 37 per cent in the third. Seven cases occurred in the fifth decade, the oldest patient being forty-nine years of age, the mother of nine children. Our youngest patient was eighteen years old and had one child three months old. I think we may safely state that no time in the conceptive period of a woman's life is exempt though the most frequent incidence is during the most active period of child-bearing, that is between 24 and 33 years. Wynne found 61 per cent of 303 cases in this decade; Farrar 63 per cent; Schumman 70 per cent. Fifty-five per cent of our cases occurred in this decade.



BAR GRAPH SHOWING THE AGE INCIDENCE OF 45 ECTOPIC AGAINST 90 NORMAL PREGNANCIES BY PERCENTAGES, ECTOPICS REPRESENTED BY SHADED BARS

GRAPH I

We operated upon one patient twice for extra-uterine pregnancy. At the age of twenty-four she had a pregnancy in the right tube, and at thirty-four one in the left tube. This brings up the question of whether or not we should take out the unimpregnated tube at the first operation. My personal opinion is *no*, as the following case will demonstrate. A patient became pregnant soon after marriage and a tubal pregnancy resulted. She was operated upon and the tube removed but since this time she has borne four children safely and normally. One of our patients had had an ectopic pregnancy elsewhere some years before coming to the clinic, when a second tubal pregnancy was diagnosed on the opposite side. In the meantime, however, she had had one child, with a normal pregnancy and delivery.

One of our patients had a right sided hematosalpinx with a left sided extra-uterine pregnancy.

We have had two cases of abdominal pregnancy with a non-viable child. In one the placenta was attached to the omentum and loops of intestines, and in the other case there was a placental attachment to the tube. The fetus was free in the abdominal cavity.

Two of our patients had, we believe, ovarian pregnancies, though neither was proven.

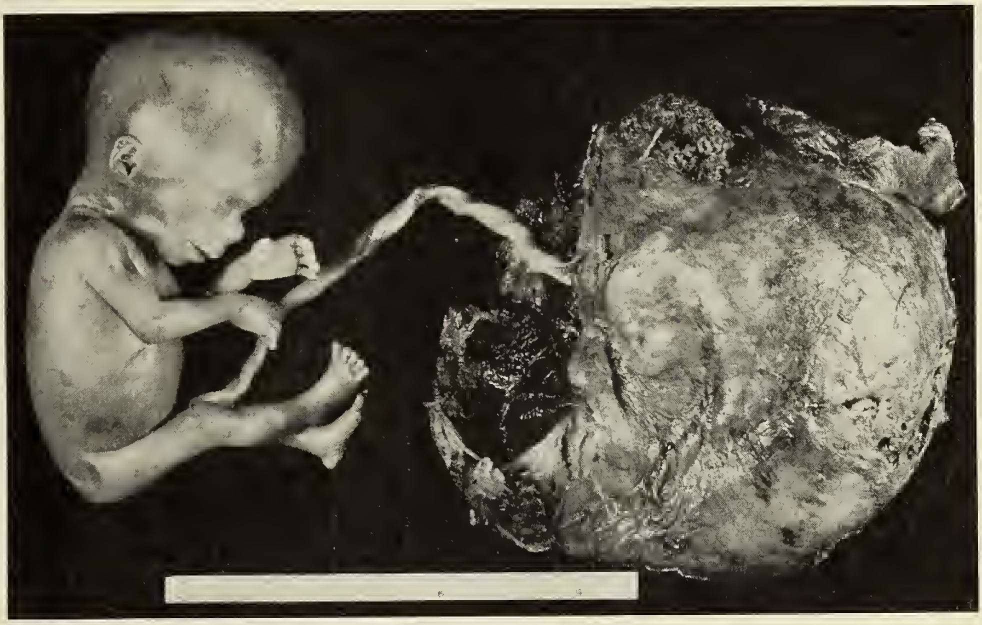


Fig. 1. Questionable tubo-ovarian pregnancy, unruptured.

One case (Fig. 1) is a questionable tubo-ovarian pregnancy that is now being further investigated at the University of Minnesota. This was an unruptured right-sided pregnancy.

One of our cases was that of an interstitial pregnancy where it was necessary to do a hysterectomy.

In this report covering a series of fifty-three cases, there has been one death, as mentioned above.

Frequency.—All old statistics regarding the frequency of extra-uterine pregnancy range from one in five hundred to one in twelve hundred pregnancies. At present I think the frequency is considered about one in three hundred.

In order to find out the incidence in the Twin Cities, the writer consulted the records of the hospitals of the Twin Cities as to the number of births, miscarriages and extra-uterine pregnancies, entered and treated during the years 1926 to 1931 inclusive. The Department of Health records of the Twin Cities were consulted also with the idea of obtaining the relative proportion of labor cases hospitalized, and we found deliveries at the Minneapolis Hospitals were 71 plus per cent of the total and we felt that the home treatment of abortions and miscarriages would in all probability approximate the same ratio and in this way, and from these figures, we could derive the total number of intra-uterine pregnancies. A similar study was made of St. Paul, where we found the hospitalized cases of obstetrics were 72 plus per cent of the total. Our findings give us approximately the following figures:

Minneapolis Health Office:	
Births	48,129
Stillbirths	1,853
Miscarriages	4,867
Minneapolis Hospitals:	
Births	39,580
Miscarriages	3,981
Ectopics	412
St. Paul Health Office:	
Births	31,341
Miscarriages	3,698
Stillbirths	1,098
St. Paul Hospitals:	
Births	23,583
Miscarriages	2,777
Ectopics	268

The total number of miscarriages throughout the cities of Minneapolis and St. Paul must of necessity be approximated on a ratio basis but we feel that these figures are quite reasonably accurate.

Symptoms.—These are interesting and valuable (Graph IV). The writer believes the most valuable single item is the history. Early tubal pregnancy differs very little from a normal preg-

MINNEAPOLIS

HOSPITALS				HEALTH OFFICE				
Year	Deliveries	Miscarriages and Abortions	Ectopics	Living Births	Still-births	Calculated Abortions	Total Pregnancies	Pregnancies per Ectopic
1926	6,391	624	87	9,192	319	911	10,422	120
1927	6,682	652	50	8,630	304	842	9,776	195
1928	6,486	656	73	8,348	376	844	9,568	131
1929	6,391	705	67	6,945	310	782	8,037	120
1930	6,845	620	77	7,037	270	637	7,944	103
1931	6,785	724	58	7,977	274	851	9,102	157
Total	39,580	3,981	412	48,129	1,853	4,867	54,849	133

Ect. P. 412—11 deaths—2.6% 1:37
Ut. P. 54,849—286 deaths—0.52% 1:192

SAINT PAUL

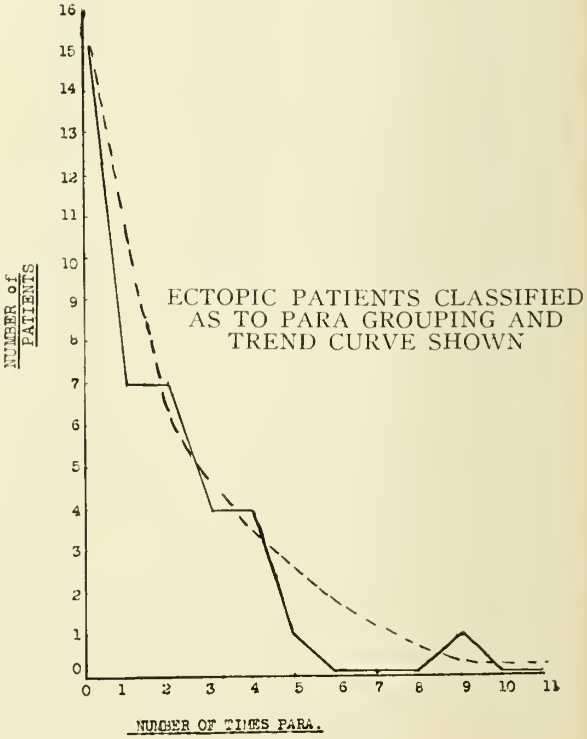
HOSPITALS				HEALTH OFFICE				
Year	Deliveries	Miscarriages and Abortions	Ectopics	Living Births	Still-births	Calculated Abortions	Total Pregnancies	Pregnancies per Ectopic
1926	4,022	476	53	5,660	211	655	6,526	123
1927	4,064	460	34	5,463	183	618	6,264	184
1928	3,771	441	42	5,112	168	597	5,877	140
1929	3,902	481	41	5,149	171	660	5,980	145
1930	3,965	456	52	5,074	196	583	5,853	112
1931	3,859	463	46	4,883	169	585	5,637	123
Total	23,583	2,777	268	31,341	1,098	3,698	36,137	134

Ect. P. 268—11 deaths—4.1% 1:24
Ut. P. 36,137—125 deaths—0.34% 1:289

From this study and these figures—in Minneapolis we find the incidence of extra-uterine pregnancy as compared to intra-uterine pregnancy to be one in 133; in St. Paul, one in 134. The mortality rate was 2.6 per cent for Minneapolis and 4.1 per cent for St. Paul.

In our cases the ectopic pregnancies were right-sided in 62 per cent and left-sided in 38 per cent. This closely corresponds to the location of pain as shown in Graph III.

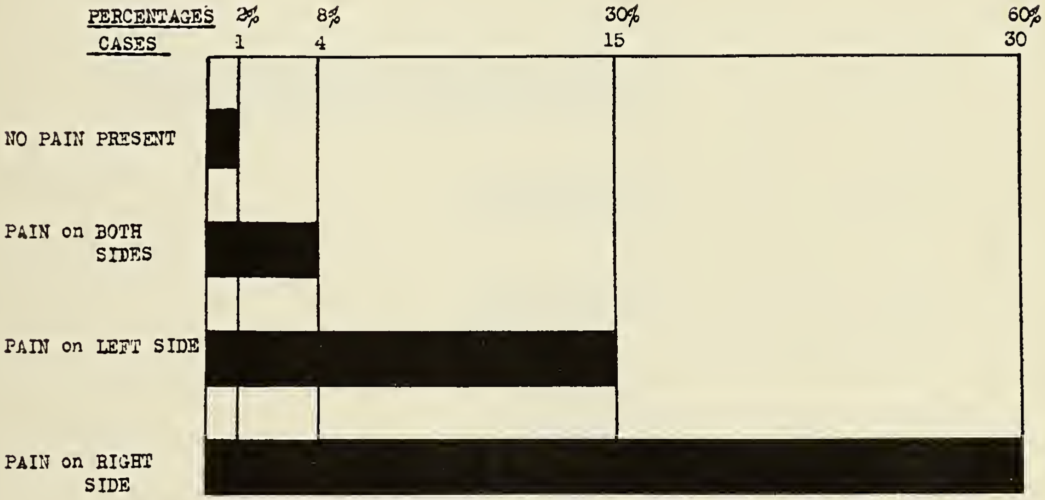
A drop in the hemoglobin usually accompanies either intra- or extraperitoneal hemorrhage. The lowest hemoglobin recorded in this series was 40 per cent; the highest 90 per cent (usual hemoglobin 70 to 75 per cent). The red cell count is of little value and is usually in direct ratio to the hemoglobin. More important however is the white count, which, in most cases of intra-abdominal hemorrhage, is accompanied by an increase in the leukocytes and a relative increase in the polymorphonuclears. The count most often ranges between 12,000 and 15,000. Our lowest white count, however, was 4,400, while our highest was 45,500.



GRAPH II

nancy and to diagnose a case of extra-uterine pregnancy before rupture is rarely possible. It has been our good fortune to recognize one such case, in consultation with Dr. Litzenberg, which was proven by operation. This, he says, was the earliest case he has seen.

LOCATION OF PAIN IN ECTOPIC PREGNANCIES: 50 CASES



GRAPH III

A history of amenorrhea for one or more periods is usual though cases do occur where menstruation has been regular. When rupture occurs, the patient experiences pain in abdomen and frequently faints or feels faint. There is usually also pallor, rapid breathing and increased pulse rate. This may be due to rupture of a tube or to a tubal abortion and it may be difficult at this stage to differentiate between them. Usually as a concomitant symptom, there is some slight or even severe bleeding from the uterus with expulsion of the whole or parts of the decidua.

On pelvic examination the uterus feels softened and is pushed to the side of the normal tube. A tender boggy mass is felt on the side involved, and often we have found a symptom which is rarely described, namely, a definite fullness or pressure or pain in the rectum with an urge to move the bowels. This symptom was present in 56 per cent of our cases. Vomiting may be a symptom; temperature and pulse may be elevated. All symptoms may abate and the effusion may become encysted. There is always a grave risk of recurring hemorrhage with pain and shock.

Diagnosis at times may be uncertain. If the patient presents the symptoms of early gestation and a unilateral swelling is found in the pelvis, the history of pain, shock (rapid pulse and respiration), and bleeding from the vagina, extra-uterine pregnancy must be considered and disproven, bearing in mind always that old inflammatory conditions of the tubes or ovaries or the presence of an ovarian cyst with twisted pedicle may give rise to symptoms closely simulating extra-uterine pregnancy. An accurate diagnosis can often be made only by abdominal exploration.

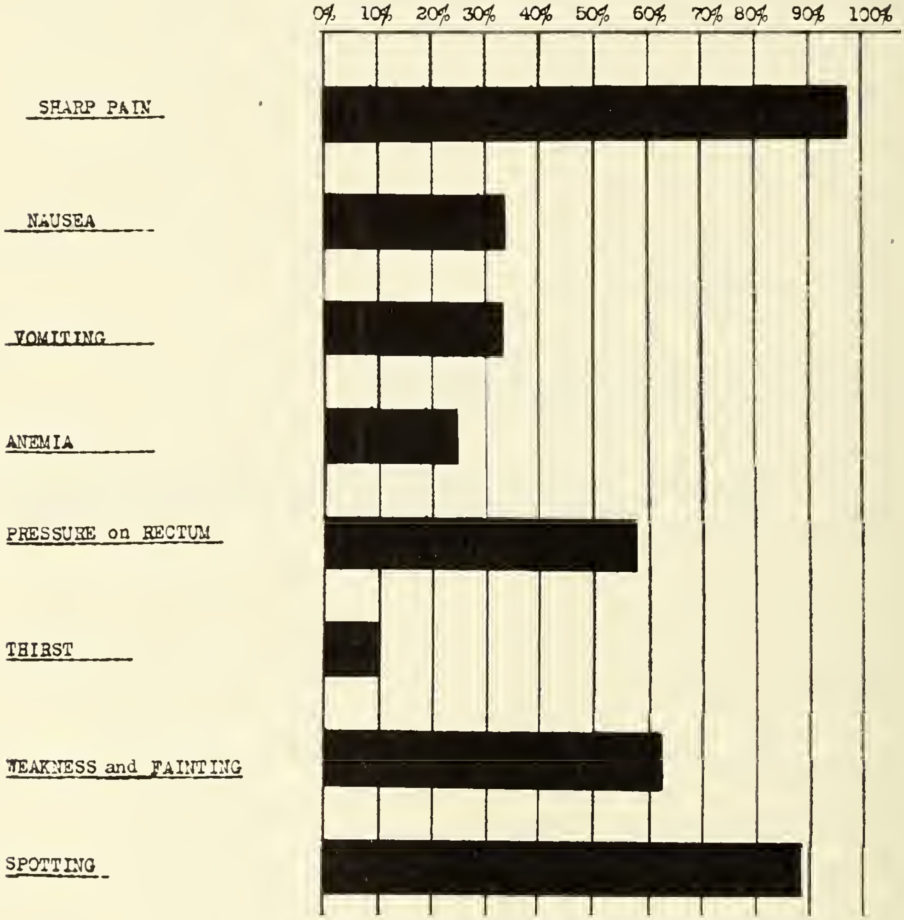
A history of lower abdominal pain, whether severe or not, of faintness or actual syncope, one or more missed periods, and the presence of pallor, rapid pulse and respiration, are practically pathognomonic of a ruptured extra-uterine pregnancy and, if confirmed by pelvic findings, operation is imperative.

SUMMARY

This report of fifty-three cases of extra-uterine pregnancy is presented with the idea of interesting the profession in the earlier diagnosis and treatment of this condition, in this way decreasing its mortality. We feel there should be no significant mortality if the diagnosis is made early.

A general résumé of the types and the incidence of extra-uterine pregnancy is given. We find that the frequency is higher than most authorities would lead us to believe.

SYMPTOMS OCCURRING WITH ECTOPIC PREGNANCIES SHOWN BY A PERCENTAGE RATIO OF THE TOTAL NUMBER OF CASES



GRAPH IV

A study of the vital health statistics over a six year period in the cities of St. Paul and Minneapolis showed an incidence of one ectopic pregnancy to 133 intra-uterine pregnancies in Minneapolis, and one to 134 in St. Paul.

The decade in which we found the greatest incidence corresponds to the most active child-bearing period, namely, between the ages of twenty-four and thirty-three (55 per cent).

In this series there were two cases of abdominal pregnancy with a non-viable child. Two cases were believed to be ovarian, one tubo-ovarian, one interstitial, showing that various types may be found in even a small series of cases.

The presence of a leukocytosis is a very important consideration, most cases showing an increase ranging from normal to 28,600, with an average of 12,000 to 15,000.

The most important diagnostic criteria are: (1) history of missed menstruation; (2) lower abdominal pain, severe or slight; (3) vaginal bleeding; (4) presence of a pelvic mass. These findings plus pallor, shock or actual fainting, we believe are usually pathognomonic of a ruptured extra-uterine pregnancy. Pain or pressure on the rectum is a symptom which was found in 56 per cent of our cases, and which we believe to be of diagnostic value.

BACTERIOPHAGE IN THE TREATMENT OF OSTEOMYELITIS*

A STUDY OF TEN CASES, INCLUDING THREE CASES COMPLICATED BY STAPHYLOCOCCUS AUREUS SEPTICEMIA

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AN opportunity was offered to the Department of Surgery at the Michigan University Hospital to study the effect of bacteriophage on osteomyelitic wounds. Since the use of bacteriophage as a therapeutic agent in surgery is comparatively new, especially in the treatment of osteomyelitis, it was thought best to limit the number of cases in this study to a relatively small group. Accordingly, ten cases, representing the usual variety of osteomyelitic cases seen at the hospital, were selected. After about eighteen months of observation of these wounds, it was believed that a preliminary report would be justifiable.

The infecting organism in osteomyelitis is most often the Staphylococcus aureus. Excellent results are reported in the use of staphylococcus bacteriophage for other staphylococcic infections, *i.e.*, acne, furunculosis, carbuncles, sycosis, subcutaneous abscesses, pyelonephritic abscesses, etc. (Bruynoghe and Maisin,[1] Bazy,[2] Barboza,[3] Hauduroy, Camus, and Dalsace,[4] Rice,[5] McKinley,[6] Larkum[7] and others.) It was thought that this bacteriophage might also be successful in the treatment of osteomyelitis.

The use of bacteriophage for osteomyelitis has been rather limited. Claeys and Peyre[8] report a case of a child with acute osteomyelitis of the ribs who was cured in forty days by the local application of an auto-bacteriophage to the wound following operation. They also report the case of an adult who had had chronic osteomyelitis of the right femur since the age of twelve and had had fourteen previous operations. Cure was obtained in less than five months following the application of the autobacteriophage to the wound. Delbet, Mocquot and Mornard[9] report two cases of osteitis treated by "vaccino-therapie-locale." Both were cases of persistent fistulæ following operations on osteomyelitis of the tibia. "Le propidon" was used in the fistulæ in doses of 4 c.c. at two-day intervals. In one case the fistula remained closed after three months. In the second case the fistula closed rapidly with the treatment, but reopened after one and a half months. A new operation again left a fistula. These investigators make the observation that where there is necrosed bone, "vaccino-therapie" alone will not effect a cure. Rice[5] makes a similar observation in reporting eleven cases of osteomyelitis treated by bacteriophage with four excellent results, three fair results and no effect in four. If there was dead bone in the lesion, the bacteriophage was apparently of no avail. When all necrotic bone was removed, good results were obtained. McKinley[6] reports four cases of osteomyelitis with rapid healings following the use of bacteriophage injected into and about the wound. One of his cases showed a sequestrum by X-ray examination.

Bacteriophage has been in use at the University Hospital since 1929. It has been used mainly in infections due to B. coli or staphylococci, though it has also been used against B. typhosus and paratyphosus, B. dysenteriæ and the streptococcus. The bacteriophage used in this study was the Gratia H. Strain for staphylococci. This was furnished by the Department of Clinical Laboratories of this hospital and was prepared in accordance with a method described elsewhere.[10] We did not use the mixed bacteriophage used by Rice in his series of cases.

Of the ten cases treated, three were cases of acute osteomyelitis complicated by a staphylococcus aureus septicemia. There was one case of subacute osteomyelitis of eighteen days' duration. One case was an osteomyelitis developing in a Steinman pin wound while under treatment in the hospital. The remaining five cases were of chronic osteomyelitis with a duration of two months to five years, all of whom entered with draining sinuses, sequestra, or soft tissue abscesses following a recent exacerbation of the chronic process.

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*From the Departments of Surgery and Clinical Laboratories, University of Michigan.

In all of the cases, sufficient saucerization was done, adequate immobilization was maintained, and general supportive measures were given. The wounds were cultured at operation and the organisms obtained were tested for lysis in vitro with the bacteriophage in use. In only one case were the organisms not lysed in vitro by the bacteriophage and in this case an autobacteriophage was prepared.

In three cases (Cases 1, 2, 3) dressings moistened with bacteriophage were used. The usual procedure in these cases was: Following the saucerization, gauze packs wet with the bacteriophage were packed into the wound. Every four to ten days a dressing was done. At the time of the dressing, precautions were used to maintain asepsis as far as any outside contamination was concerned. The skin about the wound was cleansed with alcohol, being careful not to get any alcohol into the wound itself, and no other disinfectant was used. The packing was removed from the wound and fresh gauze packs moistened in bacteriophage were inserted. In several of the cases bacteriophage was not used at the beginning of the treatment of the wound but was instituted after a second operation or at the first dressing following the operation, acriflavine or vaseline packs being used originally.

In four cases of this series subcutaneous or intramuscular injections of bacteriophage were used in addition to the dressings moistened with bacteriophage. The injections were given in 1 to 3 c.c. doses at intervals of twenty-four to forty-eight hours. One or two injections were used.

In three cases bacteriophage was given intravenously in 3 to 5 c.c. amounts in addition to the bacteriophage dressings in the wounds. One or two injections were given at intervals of twenty-four hours to five days. In one case this series of injections was repeated after an interval of two months.

The cases have been grouped according to the manner of treatment. The following three cases were treated with bacteriophage dressings alone.

Case 1.—A boy of eleven years with chronic osteomyelitis of the entire shaft of the left tibia. He had had a saucerization and an incision and drainage of a large abscess. Eight weeks after admission he had a sequestrectomy and at this time the bacteriophage was started. The culture at operation was Staphylococcus aureus, Streptococcus hemolyticus, and B. mucosus capsulatus. His strain of Staphylococcus aureus was resistant to the Gratia H. Strain bacteriophage but was lysed in vitro by a bacteriophage prepared for it. However, the wound appeared necrotic and after three dressings at intervals of five to eight days the bacteriophage was discontinued.

Case 2.—A boy of ten years who had fractured both femora in an automobile accident and entered the hospital in shock. He developed many complications, including a "coccus kidney," measles, chicken-pox and tonsillitis; also an osteomyelitis at the site of insertion of the Steinman pin in the right femur. This wound was irrigated with bacteriophage when dressings were done, but as no improvement was noted and X-ray demonstrated a definite bone abscess, a local saucerization was done. Following this the patient developed an erysipeloid reaction and was treated as for erysipelas and the bacteriophage discontinued. The culture showed Staphylococcus aureus and Streptococcus hemolyticus.

Case 3 was a boy of seven years with a severe osteomyelitic process involving the lower two-thirds of the left femur. A very radical saucerization was necessary, at which time the entire lower end of the femur was removed. Following this operation, bacteriophage packs were used and these were irrigated with bacteriophage through Dakin's tubes. Unfortunately the wound became secondarily infected with B. pyocyaneus, against which the bacteriophage had no effect. Therefore irrigations were changed to 0.5 per cent acetic acid and later to Dakin's solution. It was necessary to perform a mid-thigh amputation later.

The following four cases were treated with subcutaneous or intramuscular injections in addition to dressings of bacteriophage.

Case 4.—A girl of four years with osteomyelitis of the entire left tibia of about eighteen days' duration. An operation had been performed before her entrance to the hospital. On admission, X-ray showed sequestration of the entire shaft of the tibia. A more radical operation was performed and bacteriophage dressings were done at intervals of four to six days and two subcutaneous injections of bacteriophage of 1 c.c. each at a forty-eight hour interval were given. The child showed rapid improvement in general health. Sequestra were obtained from the wound occasionally and at the end of three and a half months the wound was nearly healed. At six months the incision was entirely healed and the child was able to go about without additional support to the tibia. Subsequent examinations have been negative.

Case 5.—A girl of thirteen years who had an acute exacerbation of an old chronic osteomyelitis of the lower third of the left femur. A large subperiosteal abscess was drained and saucerization of the left femur was done. Further saucerization was necessary, which left a mere shell over the condyles of the femur and a very thin portion of bone posteriorly. Bacteriophage dressings were instituted just previous to this last operation and were used consistently afterwards. Acriflavine was used on the original dressings. One injection of 1 c.c. of bacteriophage was given intramuscularly. During one change of dressing, a large sequestrum was removed and a pathologic fracture was noted at the point where the sequestrum had become separated. However, dressings were continued over a long period at intervals of five to seven days. The large wound gradually filled in and X-ray showed new bone formation filling in the defect. The wound was practically healed eight months after entrance to the hospital and the patient was upon a non-weight bearing walking caliper. She later refractured her leg and developed non-union at site of the fracture. A year and a half after her original admission, the area of non-union was operated upon.

Case 6.—A boy of twelve years who entered with multiple osteomyelitis involving the entire right femur with sequestration of the head of the femur, the lower two-thirds of the left femur with a pathological supracondylar fracture and a separation of the lower femoral epiphysis and the upper one-third of the right tibia. The general condition of the boy was very poor. Complete radical saucerization was impossible because of the extent of bone destruction. Sequestrectomies and sufficient saucerization to obtain drainage were done in stages. Vaseline dressings used originally were changed to bacteriophage dressings twelve days after the second operation and one month after admission, and these were maintained. Two injections of bacteriophage of 2 and 3 c.c., respectively, at forty-eight hour intervals were given subcutaneously. Although this boy is still under treatment, eleven months after admission a marked improvement is noted in the general condition and in the X-ray pictures.*

Case 7.—The fourth case to be treated with subcutaneous injections was a child of four years with multiple osteomyelitis involving practically every bone of the body, including the skull. Radical saucerizations of all foci except the skull were performed. Bacteriophage was twice injected subcutaneously in 1 c.c. doses at an interval of forty-eight hours. The wounds themselves were not consistently treated with bacteriophage. The child showed some general improvement though new foci continued to develop. The blood cultures were at all times negative. The child was subsequenlty discharged considerably improved. Later a letter stating that the child had died from meningitis was received at the hospital.

septicemia. All were critically ill at the time of

Of the three patients treated by intravenous injections, in addition to dressings of bacteriophage all were complicated by a Staphylococcus aureus admission five to seven days after the onset of acute symptoms. Incision and drainage of the foci were done as indicated and the bacteriophage dressings were applied to the wounds. Intravenous injections of bacteriophage were not made until after the septicemia had been diagnosed by blood culture except in the second case of this series, where the extreme condition of the patient seemed to warrant the treatment without waiting for the result of the blood culture.

All three patients had severe reactions following the administration of the bacteriophage intravenously. They showed dyspnea, cyanosis, and shallow respirations while having severe chills, and later they became very drowsy or delirious. However, in each of these cases the condition previous to administration of the bacteriophage was exceedingly poor, the temperatures were high and in none of the cases was there expectation of recovery. Two of these paients died. One is living. It is interesting to note the blood cultures in these three cases.

Case 8.—A boy of twelve years with a primary focus in the right ankle and metastatic foci in both clavicles, humeri and parotids. A summary of the blood cultures and intravenous treatment follows:

Blood culture taken	Reported	Result	Remarks
10-18-30	10-20-30	Staphy. aureus	3 c.c. bacteriophage IV given 10-20-30
10-20-30	10-22-30	Staph. aureus	3 c.c. bacteriophage IV given 10-22-30
10-21-30	10-23-30	Staph. aureus	
10-22-30	10-24-30	Staph. aureus	
10-23-30	10-30-30	No growth	After 7 days culture
10-24-30	10-31-30	No growth	After 7 days culture
10-25-30	10-31-30	Staph. aureus	After 6 days culture
10-30-30 (day of death)	11- 3-30	Slight growth	After 4 days culture

Although an autopsy was not obtained the terminal complications were diagnosed a diffuse pleuritis and pericarditis.

Case 9.—The second patient of this series was a boy of ten years with osteomyelitis of the right tibia. He entered the hospital dehydrated and irrational and was moribund throughout the short period in the hospital. A diagnosis of septicemia was made and he was given bacteriophage intravenously. A summary of the blood cultures and intravenous treatments follows:

Blood culture taken	Reported	Result	Remarks
1-19-31	1-21-31	Staphy. aureus	3 c.c. bacteriophage given 1-19-31 3 c.c. bacteriophage given 1-22-31

---

*Since this article was written this patient was given non-weight bearing walking calipers and is now up and about. He has full range of motion, left hip; ankylosis, left knee; limited motion, right knee and right hip. He still has draining sinuses in the lower third of the left thigh and at the upper end of the right tibia. He has gained weight and his general condition is very much improved.

1-21-31	2-2-31	Staph. aureus with slight growth of Pneumococcus type IV	10 days before growth appeared
1-23-31			death

It is noted that in each case the growth of the organism has been inhibited if not completely arrested.

Case 10.—The third case was a girl of fourteen years who entered with multiple septic joints. For five days after admission positive blood cultures were obtained. Two doses of 5 c.c. each of bacteriophage were given intravenously at an interval of 48 hours. For the six days following the initial injection positive blood cultures were obtained though the culture did not appear until after 48 or 72 hours, but on the seventh day negative blood cultures were obtained and check examinations during the next twenty days still showed negative cultures. However, the patient already had severe osteomyelitic processes in her left scapula, left humerus and left ilium as well as her many septic joints, both wrists, left elbow and left hip. Following an exacerbation of the process in her left ilium another blood culture was taken (exactly fifty-six days following the first negative blood culture). Two days later this was reported positive and four days later the patient was given a 3 c.c. injection of bacteriophage intravenously which was repeated after an interval of five days. Seven days after the first injection the blood cultures were again negative and remained so. Except for two very small abscesses the patient has remained quite well following her discharge from the hospital. At present the left hip and left elbow are ankylosed but she is able to attend school. It is only fair to state that during the acute stage of this disease the patient voluntarily took 5,000 to 13,000 c.c. of fluid per 24 hours and received four transfusions of whole blood.

DISCUSSION

So many factors enter into the treatment of an osteomyelitic case that it is difficult to evaluate the various therapeutic agents. The bacteriophage, although given prominence in this paper, was only one factor in the treatment of these cases. Its value cannot be judged so much by the ultimate outcome of the case as by the appearance of the wounds during treatment.

It was necessary to maintain absolute asepsis during the dressings of the wounds, as the bacteriophage while lytic to the staphylococcus has presumably no effect on other organisms. In those cases where the wound was secondarily infected with other organisms either before (Cases 1 and 2) or during (Case 3) the treatment, the bacteriophage seemed to have little or no effect and it was necessary to resort to other treatment. Particularly was this noted in those wounds where the streptococcus was present.

In those cases where the bacteriophage seemed to be of decided benefit (Cases 4, 5, 6 and 10), the wounds were treated systematically, and rapidly (at the time of the first dressing) presented unusually clean appearing, fine, red granulations. The discharge from the wounds was always copious and as the dressings were left undisturbed, in some cases longer than a week, they were often foul smelling. However, the wounds were not uncomfortable to the patient and there was a gradual improvement in the patient's general condition coinciding with the improvement in the wound.

In Case 7, there was improvement in the child's condition though the multiplicity of the lesions and the marked involvement of the skull made any treatment insufficient.

Severe septicemias existed in Cases 8 and 9 and the patients would no doubt have died regardless of any treatment. One lived twelve days and one four days after admission to the hospital. The wounds therefore were not under observation for any length of time and the only possible benefit attributable to the bacteriophage was the effect upon the organisms in the blood stream.

In this series of cases, no general symptoms were noted in those cases where the bacteriophage was used intravenously it was difficult to bacteriophage was given intramuscularly or subcutaneously, no reactions whatsoever occurred in two cases, whereas the other two showed swelling and redness at the site of the injection and the patients had mild chills and slight elevation of temperature about two hours following the injection. In the three cases where the bacteriophage was used intravenously it was difficult to determine what part of the picture might be considered a reaction. However, all three patients had severe chills and showed cyanosis and dyspnea for a period of several hours.

Of additional interest in this study was the finding, in those cases of osteomyelitis complicated by a Staphylococcus aureus septicemia, of a definite reduction of the organisms in the blood stream following the intravenous injection of bacteriophage. Although two of three septicemia patients died, the growth of the organisms from the blood had been inhibited before death occurred and it was thought that death in each case was due to other complications. In the one patient that survived, it was demonstrated on two occasions that the blood culture could become negative following the use of bacteriophage intravenously.

We find that intravenous injections of bacteriophage are condemned by most of the workers with bacteriophage. Maute[11] working with a "solution bacteriennes" used it intravenously with excellent results in staphylococcic infections and had no untoward effects.

Gosset[12] reports marked and rapid improvement in a patient having a diffuse phlegmon of the thigh without septicemia, who was treated by 5 c.c. bacteriophage diluted with physiological serum and given intravenously. His patient had a severe chill and elevation of temperature following the injection. Hauduroy[13] however states that bacteriophage should never be used intravenously because the product which one injects is a culture of bacteriophage in peptone water or broth and the introduction of peptone into the veins would give a general reaction which might be fatal. He also calls attention to the fact that treatment of septicemia is useless, perhaps because therapy is always started late. Rice[5] reports two patients with staphylococcus septicemia treated by subcutaneous injections of bacteriophage. Both patients died though one was moribund on admission and one lived weeks longer than was to be expected. Bacteriophage was not used intravenously because the effect of the peptone broth was feared.

SUMMARY

A study was made to test the therapeutic value of staphylococcus bacteriophage in the treatment of osteomyelitic wounds. Ten cases were studied. Of this number three had wounds which were infected with several types of organisms. These did not respond to the bacteriophage treatment although the bacteriophage was used on dressings only. Four patients having a pure culture of Staphylococcus aureus were treated by subcutaneous and intramuscular injections as well as by dressings, and three of these have shown good results. One died of meningitis due to osteomyelitis of the skull. The three remaining cases of osteomyelitis were complicated by Staphylococcus aureus septicemia and were treated by intravenous injections of the bacteriophage. Two of these patients died, one survived.

It would appear that the best response to bacteriophage therapy is obtained in those cases of staphylococcus osteomyelitis that are uncomplicated by the presence of other organisms or by septicemia. It should be mentioned that these uncomplicated cases of staphylococcus osteomyelitis are the ones that respond best to other methods of treatment.

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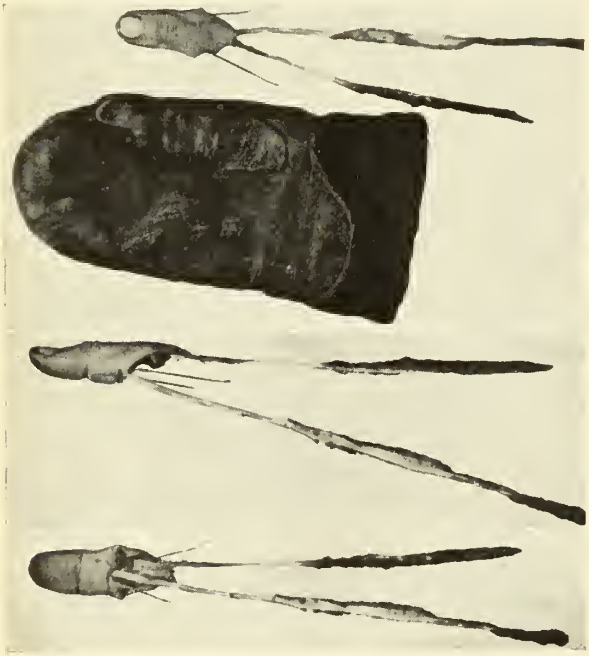
CASE REPORTS

AMPUTATION OF THUMB BY TORSION*

Earl C. Henrikson, M.D., and E. G. Benjamin, M.D.
Minneapolis

A boy, eighteen years of age, while cranking a one cylinder engine with a detachable crank, caught the thumb of his mitten on the engaging key or pin on the crank-shaft as the engine started. There was a sudden painless wrenching sensation in his forearm as the glove was thrown to the ground by the revolving shaft. The fact that his thumb had been amputated rather than sprained (his first impression) was called to his attention by the sudden gush of blood from the stump. A bandage was applied to control the hemorrhage, and he was brought to the Minneapolis General Hospital at once by a friend. Before removing the dressings, the patient was asked how much of the thumb had been torn off. On replying that he did not know, the friend handed one of us the mitten the patient had worn, stating that he thought the part that had been torn off was still in it. Examination revealed a heavy pigskin mitten (Fig. 1) intact except for a slightly loosened seam along the outer surface of the thumb. In the thumb of the glove the amputated digit was found (Figs. 1, 2, and 3). To it were attached the flexor and extensor pollicis longus tendons which had been torn from their origins high in the forearm. Vessels and nerves also protruded outwards. An X-ray of the amputated digit was taken and is shown in Figure 4.



Figs. 1, 2 and 3

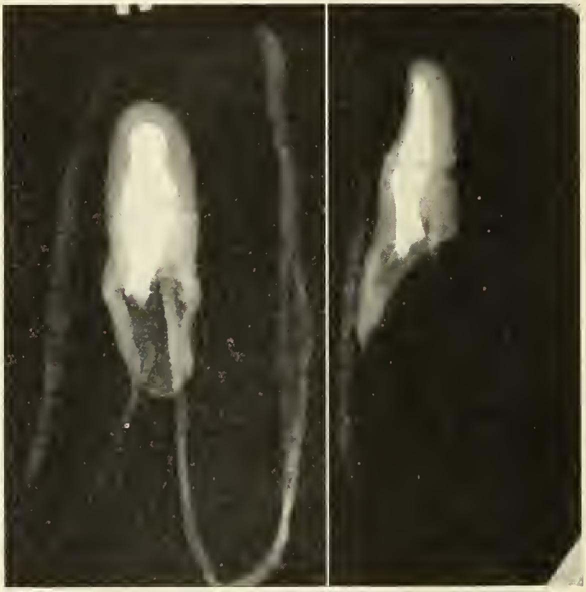


Fig. 4

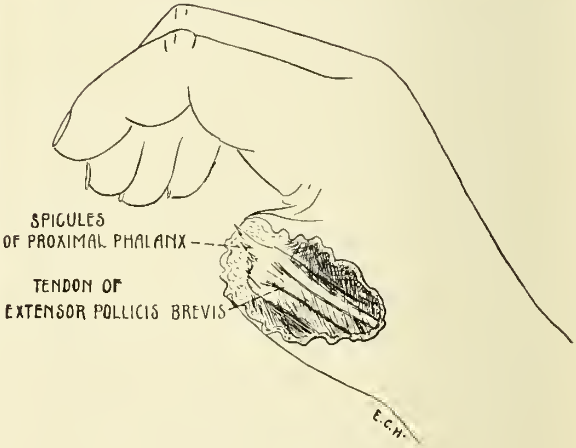

SPICULES OF PROXIMAL PHALANX
TENDON OF EXTENSOR POLLICIS BREVIS
E.C.H.

Fig. 5

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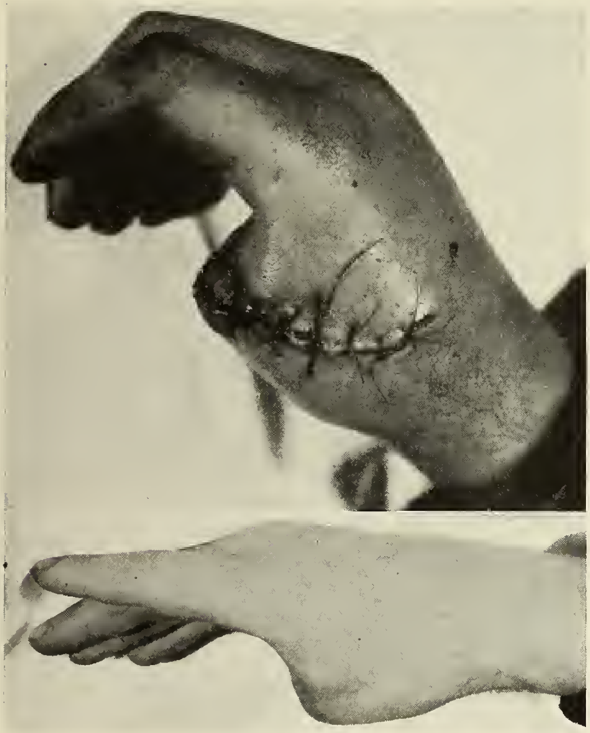
*From the surgical department of the Minneapolis General Hospital.

After removing the bandage from the stump preparatory to operation, examination revealed a splintered, sharply pointed fragment of the proximal phalanx protruding through the torn tissues. The skin had been torn off obliquely from the base of the thumb anteriorly, to the metacarpo-carpal joint posteriorly (Fig. 5). A debridement was performed, the small projecting portion of the phalanx being removed. The fascia and skin were then closed primarily, using interrupted catgut and dermal sutures (Fig. 6).



Figs. 6 and 7

Three months after the accident occurred, the boy returned in successful quest of the mitten shown in Figure 1. Examination of the hand at this time showed that the wound had healed by first intention with the result seen in Figure 7.

FOREIGN BODIES IN THE APPENDIX

J. E. Engstad, M.D.
Grand Forks, N. D.

It is unfortunate that the old St. Luke Hospital records, the first hospital in the state of North Dakota, have been destroyed, and, therefore, it is impossible for us to tabulate the number of cases of offending objects found in the little organ at operation for the relief of inflammation where the foreign body was the primary cause. Fecoliths are not considered. Further, I can only approximately estimate the number of appendectomies I have performed, but it is considerably over two thousand.

The largest number of my patients in whom foreign bodies were found were those due to impaction of leaden pellets or goose shot in the lumen of the organ. In the late eighties geese were so plentiful on the Goose River and adjoining water courses, that farmers slaughtered the birds by the hundreds with the object of supplying their larder with meat for the whole season. Many farmers, during the migrating seasons, salted down two or three barrelsful of birds, supplying their meat wants for a year's time. Prairie chickens and grouse were also plentiful, and as they were shot in season and out of season, they also were killed in such numbers that they were salted down. The pellets used for goose hunting were almost the size of a small buckshot, while shot used for grouse and prairie chickens were considerably smaller. I have operated on at least half a score where from one to thirty shots were found in the lumen of the appendix, or they were scooped up from the wound in the rupture cases, of which a few came under my care. Not a single case of leaden pellets in the appendix has occurred in my service during the last twenty-five years.

One of the most virulent cases I can recall was that of a young man who remembered that while riding on top of a load of hay, he accidentally swallowed a straw he was munching. Shortly afterwards it was found in the lumen of an gangrenous appendix. It proved to be part of a so-called "foxtail."

Ordinary common pins were found in three patients.

A medical confrere referred a young man suffering from an acute attack of appendicitis. There was pain and extreme tenderness over McBurney's point and slight typanitis. Temperature and pulse were normal. We decided there was no imemdiate emergency and, therefore, the operation was postponed until the following morning, the patient having been brought in on the evening train. In the morning most of the pain and tenderness had disappeared, and there was no evidence of tympanitis. An incision was made over McBurney's point. The first cut severed the skin only, the scalpel apaprently becoming so dull that it did not sever the fascia. Considerable more pressure was applied on a second and third stroke, which caused something to give away imemdiately beneath the scalpel. It suddenly plunged through the whole thickness of the fascia and the immediate underlying structure without entering the peritoneal cavity. On inspection we found imbedded in the tissue covering the fascia a small sized darning needle, which in its migration had caused the pain and tenderness that had been mistaken for an acute attack of appendicitis. Both pieces of the broken needle were removed, the abdominal cavity was entered, and a large and slightly inflammed appendix was removed.

In the last and most interesting case of this series, we found a two and a half inch twig from a highbush cranberry loose in the abdominal cavity, from a perforation in the appendix. The patient, a doctor, while hunting in the neighboor of Grand Rapids, Minnesota, became so excited at the sight of a deer that he swallowed the twig which he had in his mouth at the onset of the buck fever. He did not give the swallowed object the slightest attention until a week or two following when he was attacked with severe griping in the lower right abdomen. He realized that he had an attack of appendicitis and immediately took the train for Grand Forks, where I operated on him an hour or so after his arrival. We found a perforation in the appendix, but otherwise the organ did not show any marked evidence of inflammation. There was marked inflammation, however, in the surrounding structure, but we were about to close the incision when I unexpectedly found the long twig in a fold behind the cecum. The doctor made a rapid and uninterrupted recovery.

To these cases may be added one where a large toothpick was the offending foreign body. A farmer living

(Continued on Page 612)

PRESIDENT'S LETTER

THOSE engaged in the pratice of medicine would like to know all there is to know about medicine, but for several generations this has been impossible; thus, many physicians are being forced to restrict their practice to certain fields in order that they may bring to their patients the benefits of advanced knowledge. Specialization in medicine has been the target for much criticism, and the specialist has been humorously defined as one who knows more and more about less and less.

Progress will not be denied. The Victorian philosopher, Herbert Spencer, in attempting to define the law of progress, said that it was but another name for increased specialization. Decry, as we will, the increased specialization in medicine—today, we must accept it as progress, and lament though we may, the passing of the good old days when the family physician was supposed to know all things, they will never return. He knew, only too well, the limitations of his knowledge. The modern family physician is one of the most useful of the specialists.

One may well wonder how far limitation of practice in the varied fields of medicine can go, for there seems no end to its growth. The ultimate controlling force will be an economic one, for when the number of specialties becomes too great an expense for the public to bear, they will be carried only so far as they can be paid for. Specialization, properly conceived and carried out, is humanitarian and a blessing, but when developed on a basis of inadequate and poor training, with subsequent laziness and indifference to progress in the field, and when used chiefly for the selfish interests of the specialist himself, it is an evil. The man who is to specialize in any of the many fields of medicine should have a sound educational background and a training that will fit him for the acquiring of new knowledge in his chosen field. He should have the mental faculties for adding to his learning the elusive wisdom. But above all, he should have that indefinable something called character, which will enable him to withstand the temptations that lead to the exploitation of his patients. With these qualifications fulfilled, we may be certain that the public will be better served.

It is difficult not only for the public, but for the profession at large, to know which men holding themselves out as specialists are properly qualified. Realizing this, the various specialties, through their organized societies, are attempting to establish some channels that will let the profession know which physicians have served the necessary apprenticeship, and can safely be entrusted with the care of patients needing special diagnostic investigation and treatment founded thereon. It is difficult to start such a roster, but once established, young physicians will be eager to have their names on it, and will be required to pass examinations and tests that will indicate their worthiness. It seems better to keep this work independent of state control.

Thus far, the education of the specialist has been a postgraduate affair and it would seem best to keep it so. However, in certain of the broader specialties it may be wise for the student to direct his undergraduate studies in the direction of his chosen field.

The medical profession of Great Britain has been more reluctant even than our own to recognize the advance of the specialties, but a recent article by Sir Humphrey Rolleston* on "The changes in the medical profession and advances in medicine during the last fifty years" points out that whereas in 1882, in the long established and well-known medical quarter of Harley and Wimpole Streets, in London, there were 116 specialists; today there are 1,125. During this period the medical population of Great Britain and London has about doubled, whereas the specialists have increased ten-fold.

Knowledge will increase and no doubt with it will grow the number of specialties, but augmentation must be governed by the common sense of the profession, and if that is not sufficient, ultimately by economic factors.

M. S. Henderson.

President,
Minnesota State Medical Association.

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*Rolleston, Humphrey: The changes in the medical profession and advances in medicine during the last fifty years. Brit. Med. Jour., 2:129-134 (July 23), 1932.

EDITORIAL

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THE NATIONAL ECONOMY LEAGUE

In an editorial entitled "Unwarranted Veteran Expenditure," which appeared in this journal in June, the opinion was ventured that the drain imposed on the Federal Treasury by unjustified demands on the part of the World War veterans had reached such a point that it would be well for truly patriotic veterans to form another organization independent of the Legion to save the government from financial ruin. This is just what was done in May of this year by a group of veterans "largely of the old Plattsburg crowd to whom it was apparent that the largest single economy that could be made in the national budget, without affecting any operating activity of the government, was the elimination of certain unjustifiable appropriations now in the law in the interest of veterans who suffered no disability in the war" as related by General Harbord at another meeting held in New York City, July 26, for the further organization of the National Economy League.

Our War Congress in 1917, in an effort to avoid some of the pitfalls and scandals formerly associated with the pension system, passed some very wise legislation.* Provision was made for life insurance up to $10,000 for each soldier at a rate he could handle with his service pay. The additional cost of the insurance issued at war time with a peace-time rate was borne by the government and this has already cost the government more than a billion dollars. Provision was also made for disability compensation on a percentage basis, as a result of which thousands of veterans, widows, children, and parents are receiving checks ranging from $8.00 to $250.00 a month. Vocational training was also supplied the veterans at a total cost of 645 millions of dollars (incidentally at an average cost of $5,000 for each graduate).

All this was right and proper, but legislation for the veterans should have stopped here with provision made for those who suffered as a result of war disabilities. As happened following other wars, however, an active minority in the veterans' organization began bringing pressure to obtain further privileges. Highly paid and clever lobbyists representing an organized minority of some 10 per cent of the voters have forced through Congress a series of bills which have virtually made of veterans a privileged class.

First came, in 1924, the Bonus or Adjusted Compensation, a term coined better to signify an inferred justice. This was roughly a dollar a day additional pay with a maximum of $500 (a dollar and a quarter a day for overseas duty, with a maximum of $625) virtually in the form of an endowment life insurance policy payable with compound interest in 1945.

It was also in 1924 that free hospitalization and certain accompanying compensation was extended to veterans for all disabilities irrespective of whether they were the result of service. Thus, if two men hit by an automobile while crossing a street sustain injuries, the one, a veteran, receives hospital and medical care and compensation at government expense; the other, too young perhaps to have been drafted during the war, pays his own costs and is taxed to help pay for his veteran companion.

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*With more than four million men called into service the possible cost from a repetition of the pension system in this war was only too evident. The last pension for a widow of a soldier in the Revolutionary War was paid in 1910. The burden of pensions has invariably been handed down to several succeeding generations. While there were fifty-three million dollars paid in 233,000 pensions fifteen years after the Civil War, some 163 millions were paid in 862,000 pensions forty years after the war.

In 1928 the Emergency Officers Law was passed. As a result several hundred individuals now in civilian life who were emergency officers in the World War are now drawing retirement pay on the same basis as a regular army officer, in addition to their regular disability compensation.

The allowance in 1931 of a loan of 50 per cent of the Bonus and the attempt to intimidate Congress this year into granting the remaining 50 per cent on the 1945 valuation is all too recent history to require coment.

The passage, by the House, of the Rankin Bill is the last straw. This provides for a monthly pension of $20 a month for every veteran's widow. If this bill becomes law one can scarcely conceive of the load that taxpayers will have to carry during the next fifty years. It is estimated by Charles M. Mills that by 1966 we will be paying $3,800,000,000 a year to the veterans if present legislation is allowed to continue.

And what has been the result of this additional legislation? Last year more than 12 per cent of the national budget was spent on veterans. If the Bonus payment in 1931 is added, practically one billion of the four billion dollar federal budget went last year to the veterans. Some six billion have already been spent on the veterans. If the present laws continue unchanged the veterans by 1945 will have cost the taxpayers of the country twenty-one billions or as much as our share of the cost of the war. As some one has stated, it might have been cheaper if Germany had won the war.

Our prodigious expenditures become the more apparent by comparison with England. Total expenditures on veterans by England decreased in 1931 some 53 per cent over 1921, while they showed an increase of 29 per cent in the United States. The number of patients in government hospitals in England showed a decrease of 96.8 per cent in 1931 compared to 1920, while in the United States there was an increase of 100 per cent in the same period. This is the result of England's adhering to a policy of paying benefits only for disabilities due to service.

The seriousness of the financial situation of federal and state government in our country is becoming more and more evident. With total federal and state indebtedness at the enormous figure of thirty billions of dollars (seven times the 1913 figure), an estimated deficit of three billions in this year's federal budget, 28.9 per cent of the federal budget necessary to pay the interest on the national debt, taxes already in many instances confiscatory, serious minded citizens may well be concerned.

What has been the attitude of the medical profession? Following the extension of free hospital facilities for non-service disabilities in 1924, state and national medical organizations passed resolutions in protest of the injustice to private hospitals, the medical profession and the taxpayers in general. Our protests were in vain. Some thought us selfish. An extensive hospital building program was begun to care for the non-service free cases which began to increase until last year they outnumbered the legitimate service-connected cases. As a compromise, the medical profession proposed the Shoulders plan to utilize already existing private hospitals and save the government the cost of further veteran hospital construction. It was felt that in emergency cases, particularly, the veteran would obtain better care with less cost. Nothing was said in the plan as to how the physician was to be paid; he as usual was to obtain his fee if he could.

Now it has become evident that the cost of providing the necessary thousands of additional beds for veterans is a comparatively small item in the total amount now being spent and to be spent in the future on the veterans. Since the war, some 450 millions have been spent for medical and hospital care of veterans. This seems like a large amount, but according to revelations being stressed by the National Economy League fully this amount of nearly a half billion dollars is being spent by the government *yearly* for non-service connected disabilities.

The first objective of the National Economy League is to bring pressure to bear to terminate this unjustifiable expenditure by the government at once, and the League should have the unanimous support of the medical profession.

The National Advisory Council of the League is headed by Ex-President Calvin Coolidge and includes the names of Alfred E. Smith, Elihu Root, Newton D. Baker, General John J. Pershing, Admiral William S. Sims, Commander Richard Byrd, with Archibald B. Roosevelt, secretary, and Graham V. Blaine, treasurer. A national executive committee of representatives from all the states is being formed under the chairmanship of Granville Clark. President Hoover has voiced his approval of such a non-partisan organization to oppose extravagance in national, state and municipal governments. It does seem as though an organization to give voice to the majority and give moral support to our week-spined legislators in resisting minority lobbies is needed.

POLIOMYELITIS IN 1932

False rumors of a recurrence of an epidemic of poliomyelitis this year in Minnesota have reached the State Health authorities. There is nothing in the reports of cases so far this year to indicate that the disease will reach anything like epidemic proportions unless the epidemic period is shifted this year from June to a date later than our going to press.

According to the State Department of Health five cases were reported in the state in January with one death following infection in December. In March three cases were reported; in April, one; in June, eight, and in July, fifteen cases. Up to the middle of August seven additional cases have been reported, two of these in Minneapolis and two in Saint Paul.

The profession should, however, always be polio-minded at this time of the year in order to detect particularly the mild cases which can so easily escape recognition.

Poliomyelitis cases and even suspected ones should be reported at once by telephone or telegraph to the Division of Preventable Diseases at the University Campus. The services of the Division are available at all times.

MISCELLANEOUS

SOCIAL INSURANCE UNDERMINES NATIONAL CHARACTER (continued)

Edward H. Ochsner, M.D.
Chicago

Someone has said, "Happy is the nation that has no history." Whoever said this probably had in mind the old type school history textbooks which contained little besides records of military campaigns, revolutions and international wars. Viewed from that standpoint the epigram was unquestionably true. Today a more suitable epigram would be: Happy is the nation that has no need for charitable organizations or devices. The ideal society would be one in which every individual can and does secure a decent living for himself and those dependent upon him by the "sweat of his brow," or by mental exertion, or, what would be better still, by the application of both brain and brawn.

There is no fundamental difference between outright charity and social insurance; both undermine character; both have a tendency to pauperize the citizen, for both rob the individual of his self-reliance and his enthusiasm and his urge for industry; they both penalize the honest, frugal and industrious, and favor the lazy, shiftless and immoral because they inevitably favor the unfair and inequable distribution of the results of labor; both encourage malingering and favor neuroses; both often give something for nothing or much for little, which is the basis of parasitism, and both delay the ultimate goal when every man shall reap the fruits of his labors.

The man who once accepts charity, particularly if it is not a case of dire necessity, is not quite so fine a man as he was before. He has lost something that nothing can replace. War, pestilence, or general disaster may reduce anyone of us to want and penury and then there is no disgrace in accepting aid from our fellowmen; but under ordinary circumstances no able-bodied individual with fair intelligence and health has any moral right to that which he has not honestly earned.

The proponents of Compulsory Health Insurance will undoubtedly say that it was with the view of saving men and women from the stigma of being paupers and the evil effects of pauperism that this and other phases of social insurance were brought forward. Exactly, but what has actually happened they did not foresee. As is so generally the consequence when a law is enacted on an emotional basis instead of on sound reasoning and adequate experience, an element was introduced even worse than pauperism; besides, pauperism was not relieved nor even mitigated.

There are two distinct types of paupers. The mentally and morally subnormal who are not, in any way, injured by the stigma of pauperism and who still remain paupers because no Compulsory Health Insurance law, so far devised, includes or can include them. They are the "unemployables" whom industry cannot use. The second class are old people, who in their youth have been lazy or extravagant, or who have lost their savings through poor investments. Those who have been lazy and extravagant are simply reaping their just reward and have no one to blame but themselves and it is morally wrong for the government to tax the thrifty and industrious for their support except in almshouses. The way to deal with the problem of the investment sharks is to teach the pupils in our high schools something about investment and to hang the gold brick and non-secure security salesman, or if this is too drastic, devise some other way of putting them out of business.

Compulsory Health Insurance has simply added parasitism to pauperism. The effect upon the insured and upon the public in general is almost as bad as it is on the medical profession. It encourages malingering and deception; it puts a premium on sloth and shiftlessness and a penalty on industry and integrity and thrift; it robs industry of its just reward; and it encourages parasitism.

One of the first effects observed after its introduction in Germany was the changed attitude of a large group of the insured. Before the law went into effect, patients came to their physicians for the relief of real ailments; after it went into effect an ever-increasing number came with imaginary and simulated ailments for the purpose of getting the sick benefit or free hospital care. The latter was particularly the case in the fall of the year when many came complaining of things that were difficult to diagnose and hence difficult to exclude, such as spinal concussion, neuritis, and vague abdominal pains. As time has passed this abuse has gradually grown to appalling proportions as the following statistics indicate. Dr. Potts, of Oak Park, cites the following:

In a check-up in Brawnschweig, two thousand eight (2,008) people on the sick list were asked to report for a check-up examination. This induced eight hundred sixteen (816) to report for work at once, two hundred eighty-nine (289) were found fit for work and only nine hundred three (903) or less than forty-five (45) per cent of those receiving sick money were actually sick. The proponents of Compulsory Health Insurance will undoubtedly say this is an individual instance. But not so. This abuse is so almost universal that it is seriously affecting the general honesty of the rank and file of the citizens of those countries where it has been in operation the longest. Social insurance is one of the major factors which has brought Germany to the very verge of economic ruin, and worse even than that—it is undermining the fundamental honesty and moral integrity of the German citizen.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

No More Discounts

What is the Minnesota Benefit Association?

Very few physicians knew what it was until someone chanced upon the bulletin published by the executive secretary of the organization in which appeared a directory of commercial and professional organizations or persons who would give a discount to association members.

Investigation showed that this was a legitimate and efficient association of city, county and village employes organized to provide disability insurance for its members; that, as such, physicians could have no possible quarrel with it. Actually, the doctor stands to profit by such organizations, as by any system of insurance, which provides funds in time of need to pay for professional services.

The matter of the directory to which a committee of the State Association took exception, in so far as it applied to physicians and surgeons or to clinics, brought committees of both organizations together to talk things over. The result of this discussion was entirely satisfactory to the doctors as the following resolution passed by the Board of Directors of the Benefit Association will show:

> "Motion made and carried that we comply with the request of the committee from the Minnesota State Medical Association and exclude from the Minnesota Bulletin any advertising relative to physicians, surgeons or medical clinics. Also that we refrain from sending out any circulars or notices stating that there would be any discount with physicians or surgeons."

The Minnesota Benefit Association is to be distinguished sharply from the various abortive group coöperative services which appear from time to time. These attempt to supply from their own organization the necessary professional services to their beneficiaries. In spite of occasionally formidable backing they do not survive.

County Society Clinics

When Dr. John R. Neal, President of the Illinois State Medical Society, talks about public health education he merits an interested audience. Dr. Neal himself and the Illinois society have been in the vanguard of the movement in organized medicine to play a leading rôle in public health education. In a talk given before the Illinois Tuberculosis Association, recently, he mentioned an Illinois experiment in public health work by a county medical society which should be of interest to county medical societies everywhere; that of the semi-annual orthopedic clinic conducted by the Warren County Medical Society of that state:

> "The very successful conduct of a clinic for crippled children in Warren county stands out as a perfect example of coöperation among three independent groups in promoting the finest type of health education. Lay organizations raise the money for the clinic. They give their time to seeing that children are transported to the place of the clinic. The health department lends its support and coöperation and the physicians bring their patients for examination and consultation. These clinics have been conducted twice a year for the last five years and complete records of progress of each patient are available. This one educational project by a county medical society has greatly benefited the public and it has as a consequence secured for the medical profession intelligent coöperation in the care of handicapped children.
>
> "It is the belief of the organized medical profession in Illinois that for the promotion of education along lines of physical well being for the welfare of children in the community and for raising the standards of public health certain things are needed:
>
> "Better coöperation between official and volunteer agencies.
>
> "Education of the general public which shall stimulate a sense of personal responsibility for health.
>
> "Better facilities for those who have been educated to look for them.
>
> "Better coördinated and more efficient means for the care and treatment of the indigent poor."

OF GENERAL INTEREST

The marriage of Miss Irene Cooney and Dr. J. J. Kolars, both of Le Center, Minnesota, took place July 30, 1932, at St. Michael Church, in Saint Paul.

Dr. W. P. Anderson, formerly of Anoka, has established offices for the practice of medicine in the Buffalo National Bank building at Buffalo, Minnesota.

Dr. and Mrs. Frank T. Cavanor of Minneapolis recently returned from a two months' stay in Europe. Dr. Cavanor is a member of the Eye, Ear, Nose and Throat Staff of the University and devoted part of his time to study in Vienna.

Dr. Alex H. Brown, his daughter Mary and niece, Miss Alice Hill, all of Pipestone, Minnesota, returned August 13 from a motor trip to Canada. They visited in Ottawa, Ashawa and Cornwall, Ont., besides other interesting points. Cornwall, Ont., is Dr. Brown's old home. Their trip into Canada and return was by way of Sault Ste. Marie.

Dr. C. N. Spratt of Minneapolis recently returned from Denver, where he lectured on "Foreign Bodies" before the Colorado Congress of Ophthalmologists and showed a three-reel film of his method of operation on cataract and glaucoma. Dr. Spratt also appeared before the Pacific Coast Ophthalmological Society at Seattle, Washington, where he showed the same film.

The Aid Association of the Philadelphia County Medical Society, organized in 1878 to furnish financial assistance for needy members, is establishing a perpetual fund in honor of Dr. John V. Deaver, the income of which is to be used to aid needy physicians or their families wherever located. Those who wish to make contribution to this worthy cause may send a check payable to the Aid Association of the Philadelphia County Medical Society addressed to the Secretary, Dr. Francis H. Adler, 313 South 13th Street, Philadelphia.

BASIC SCIENCE BOARD

NATUROPATHIC BLANKET SELLER CONVICTED

State of Minnesota *vs.* Carrigan

On July 19, 1932, James J. Carrigan, 2143 Dayton Ave., St. Paul, Minnesota, entered a plea of guilty to a charge of practicing healing without a Basic Science Certificate before the Honorable Gustavus Loevinger, Judge of the District Court.

The defendant, who claims to be a chiropractor and a naturopath, and who formerly practiced in Alberta, Canada, attempted to treat one Josephine Shanoha, 446 Goodrich Ave., St. Paul, who is afflicted with a mental and nervous disorder. In addition to giving the patient some massage treatments, defendant sold her a magna-coil electric blanket for $100.00, and rupture appliance for $12.00. The defendant has no medical education whatsoever and upon being questioned by the Court stated that he left school at the age of sixteen. The Court sentenced Carrigan to ninety days in the St. Paul Workhouse, which sentence was stayed for one year and the defendant placed on probation, conditioned that he absolutely refrain from practicing healing and from selling any devices or remedies for the curing of ailments. The Court also required the defendant to return the $12.00 received from the sale of the rupture appliance for the reason that the rupture appliance had been returned to the defendant.

Through the courtesy of the Minnesota State Board of Medical Examiners, the remarks of Judge Loevinger in sentencing the defendant are quoted:

(By Judge Loevinger) "I am mindful of the fact that one of the easiest methods of imposing upon a gullible public is to take advantage of the pain and suffering and anxiety which a person having some ailment or deformity or affliction has, and to prescribe a remedy of one kind or another. The more mysterious and the more involved the remedy is, the easier it is to get some people to accept the promise of the persons who are selling such articles or such treatments. Sometimes I think that more money is spent by the American public on worthless nostrums of one kind or another sold under pseudo-scientific explanation as to their curative value than probably for any other one thing. The least that the Court can do is to protect the public, according to law, from persons who are preying upon the ignorant and the gullible, who are subject to being deluded by such fraudulent and illusory promises. This is obviously not a case where one neighbor goes to another neighbor and tells him his own experience, to induce his neighbor to also try the same thing. We are all subject to being advised by our friends on all sorts of cures they have tried out and are alleged to have worked. In this case we are obviously dealing with a commercial enterprise in which this defendant was attempting to profit. It was not simply a case of a personal friend going to a personal friend and offering to give friendly advice. That is why the defendant is here in court and that is why the court is required to sentence him to punishment."

The remarks of Judge Loevinger clearly indicate that quacks and swindlers will have rough going when arraigned before him. The usual good coöperation was received from M. F. Kinkead, County Attorney and his staff.

CHIROPRACTOR SENTENCED TO COUNTY JAIL

State of Minnesota *vs.* Sjoden

On July 23, 1932, George Sjoden, thirty-eight years of age, a chiropractor residing at Kensington, Minnesota, entered a plea of guilty to practicing medicine without a license before the Hon. John A. Roeser, Judge of the District Court at St. Cloud.

The defendant had agreed to cure a case of eczema for a fee of $20.00. The medicine was to be obtained in Chicago and the patient was promised immediate relief.

Sjoden has previously been convicted of practicing medicine without a license and also admitted to the Court that he had been arrested on two previous occasions for writing checks without sufficient funds. Sjoden admitted that he had been in other difficulties at Mora, Princeton and Motley, Minnesota.

The defendant informed the Court that he is suffering from a severe case of asthma and stated that he would like to go to a different climate. Judge Roeser sentenced Sjoden to eight months in the Douglas county jail and gave him until August 2, 1932, to decide whether he would improve his health elsewhere. If the defendant is still present in Minnesota after that date he must serve every day of his sentence.

Splendid coöperation was received by the State Board of Medical Examiners from County Attorney Hanson and Sheriff Urness of Douglass County.

"SLEEP INDUCING" CLAIMS FOR SPECIFIC FOODS

The Committee on Foods reports that "sleep inducing" claims are not permissible for specific food beverages because of their misleading character. (Jour. A. M. A., May 7, 1932, p. 1655.)

OBITUARY

Dr. James Walter Andrist

James Walter Andrist, formerly of Owatonna, died May 21, 1932, of cardiorenal disease at San Diego, Cal. Dr. Andrist was fifty-seven years old. He was a member of the Steele County Medical Society, the Minnesota State Medical Association and the American College of Surgeons. He graduated from Rush Medical College in 1900.

Dr. Amos L. Baker

1852-1932

Word has been received of the death of Dr. Amos L. Baker of Kasson, which occurred July 20, after a prolonged illness from cardio-renal disease.

Dr. Baker was born at New Sharon, Maine, December 6, 1852. He was graduated from Rush Medical College in 1887, and was married to Miss Lulu Atwood of Monroe, Maine, in February of that year. He came to Minnesota to practice his profession, locating finally at Byron, where he lived until 1900, when he located at Kasson in Dodge County. He continued an active and extensive practice at Kasson until obliged to retire in 1926 because of failing health. He was formerly a member of the Dodge County Medical Society and Minnesota State Medical Association.

Dr. Baker is survived by his widow and two daughters, Mrs. Ethel Odden at Benson, Minnesota, and Mrs. Vera Tice of Huron, South Dakota.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of September will be as follows:

September 7—Rheumatic Fever
September 14—Baby Teeth
September 21—Problem of Drug Addiction
September 28—Tumors of the Bladder

MEDICAL RESERVE COURSE

The medico-military course of inactive duty training for Medical Department Reserve officers, which has been held at the Mayo Clinic during the past three years, will again be held this year from October 16 to 29, both dates inclusive. This inactive duty training will follow the plan so well worked out under the auspices of Colonel George A. Skinner and the military features will be under his personal supervision.

This medico-military course is based on the sound principle that when the Reserve officer gives up two weeks of his time for inactive duty training at his own expense he shold derive some benefit therefrom which will definitely help him in his profession. This method of training takes cognizance in a high degree of this principle in that the student officer gets two weeks of excellent clinical post-graduate work without fee and without any greater loss of time from his practice than normally is incurred for post-graduate work, along professional lines. At the same time he gets a definite amount of medico-military training, the benefits of which he retains.

In furtherance of this concept, the Mayo Clinic has freely placed all of its clinical material, laboratory, museum, library, and so forth at the disposal of the Medical Department Reserve officers taking this inactive duty training. The faculty and staff of the Mayo Clinic have volunteered to give their services free in the interests of national defense.

This short course is equally applicable to general practitioners and specialists. The morning hours are devoted to purely professional subjects selected by the student officers. The afternoon hours pertain solely to medico-military subjects and the evening hours are covered in a lyceum course of general interest.

Application for this course of inactive duty training should be made either to the Director of the Mayo Foundation, Rochester, Minnesota, or to the Corps Area Surgeon, Seventh Corps Area, Omaha, Nebraska. Applications should state the character of the work the candidate desires to follow in the morning hours. All student officers are expected to attend and to participate in the afternoon and evening sessions. Each applicant should fully understand that the invitation to accept this course of study without charge is extended by the Mayo Clinic; that the project is without expense to the Government; and that two hundred hours' credit will be given to those who take and complete the course.

INTER-STATE POST GRADUATE ASSEMBLY

The annual International Assembly of the Inter-State Post Graduate Medical Association of North America will be held in the Murat Theater and Shrine Temple, Indianapolis, Indiana, October 24 to 28, 1932.

Many distinguished teachers and clinicians of Canada and the United States appear on the preliminary program. Sessions consisting of clinics and addresses will occupy morning, afternoon and evening for the five days, with a banquet on Friday evening.

McLEOD COUNTY SOCIETY

O. W. Scholpp of Hutchinson was elected president and W. W. Klima, secretary and treasurer of the McLeod County Medical Society at the societies' annual meeting, June 29.

MINNESOTA MEDICAL ALUMNI ASSOCIATION

The Minnesota Medical Alumni Association, following a precedent established three years ago, will hold their annual business meeting and medical program on Friday, October 28, 1932, in the Eustis Amphitheater at the University Hospital. This will precede the regular home coming day and football game scheduled for October 29 at the University.

The morning session will be devoted to the surgical specialties. There will be a lunch and business meeting at noon. Internal medicine, pediatrics and X-ray subjects will be discussed in the afternoon. The complete program will appear in the October number.

Not only Minnesota alumni, but all medical practitioners interested, are requested to attend this meeting.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Fortieth Annual Meeting
September 12, 1932—Rochester, Minnesota

The officers of the Southern Minnesota Medical Association are: Dr. C. C. Allen, Austin, president; Dr. R. V. Williams, Rushford, first vice president; Dr. B. J. Gallagher, Waseca, second vice president; Dr. M. C. Piper, Rochester, secretary-treasurer. Dr. H. C. Habein, Rochester, is chairman of the Program Committee and Dr. S. F. Haines, Rochester, is chairman of the Committee on Local Arrangements.

Registration for members will take place in the Kahler Hotel lobby at 8 A. M., Monday, September 12, 1932. The scientific program will consist of clinics in the various specialties by various members of the Mayo Clinic staff in the different hospitals in the morning. A luncheon and business session will be held in the Kahler Hotel dining hall at 12:12 P. M. In the evening a banquet will be held at the Rochester Country Club to be followed by an informal dance. Bridge and a golf tournament will be provided in the afternoon for visiting ladies.

The following addresses will constitute the afternoon program to be held in Plummer Hall, in the Clinic Building:

1. Convulsions in adults, from a neurologic standpoint.
   Dr. E. M. Hammes, St. Paul.
2. Practical diets in the treatment of diabetes.
   Dr. A. H. Beard, Minneapolis.
3. Case of pneumothorax.
   Dr. R. V. Williams, Rushford.
   Discussion: Dr. S. W. Harrington, Rochester.
4. Bronchoscopic problems in general practice.
   Dr. V. J. Schwartz, Minneapolis
5. Case Report: Mediastinal abscess.
   Dr. H. J. Lloyd, Mankato
6. Treatment of congestive heart failure.
   Dr. H. W. Rathe, Waverly, Iowa
7. Pitfalls in the diagnosis of renal tumors.
   Dr. T. H. Sweetser, Minneapolis
8. Case Report: Hyperparathyroidism.
   Dr. J. L. Tavenner, Waseca
   Discussion: Dr. R. M. Wilder, Rochester
9. Ryerson operation for soft corns.
   Dr. E. S. Geist, Minneapolis
10. Case Report: Chronic anemia with splenomegaly and pseudo-agranulocytosis.
    Dr. P. A. Lommen, Austin
11. Modern methods of caring for the hard of hearing.
    Dr. Horace Newhart, Minneapolis
12. Further report on case of hypertension.
    Dr. C. Koenigsberger, Mankato

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Monday and Tuesday, September 19 and 20, 1932
Crookston, Minnesota

1. "Surgical Clinic"—Dr. Owen Wangensteen, University of Minnesota, Minneapolis.
2. "Medical Clinic"—Dr. Moses Barron, Minneapolis, Minn.
3. "Pediatric Clinic"—Dr. Ralph Pray, Fargo, N. Dak.
4. X-ray Demonstration—Dr. Leo Rigler, University of Minnesota.
5. Papers will be presented by the following:
   Drs. J. M. Hayes, V. J. Schwartz, Hobart Reiman and J. K. Anderson, Minneapolis.
   Drs. J. R. Manley, C. M. Smith and F J. Hirschboeck, Duluth.
   Drs. Waltman Walters or D. J. Balfour, and Dr. Russell Wilder or Dr. C. H. Watkins, Rochester.
   Dr. O. J. Hagen, Moorhead.
   Dr. S. Sturmans, Erskine.

Dr. D. Stewart of Nanette, Minn., has also been invited.

Ex-Governor, Theodore Christianson will speak at the banquet Monday evening on "An Answer to Pessimism."

Dr. O. M. Oppegaard is in charge of the local arrangements.

The officers of the Society are: President, Dr. George Wattam, Warren; vice president, Dr. C. M. Smith, Duluth; Secretary and Treasurer, Dr. C. J. Larson, Detroit Lakes.

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. Edward Schons, Saint Paul
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

The annual meeting of the Women's Auxiliary of the Minnesota State Medical Society was held in the St. Paul Auditorium on May 24 and 25, with Mrs. James Blake presiding. An Executive Board meeting with luncheon at the Women's City Club constituted the program for the first day. On May 25 an open meeting and the election of officers took place. This was followed by the Annual Luncheon in the Palm Room of the St. Paul Hotel. At this time, Mrs. James Blake, State President, introduced the following officers for the coming year: President, Mrs. Edward Schons, St. Paul; president-elect, Mrs. A. A. Passer, Olivia; recording secretary, Mrs. Werner Hemstead, St. Cloud; treasurer, Mrs. W. A. Coventry, Duluth; auditor, Mrs. B. R. Karn, Ortonville; first vice president, Mrs. A. M. Hanson, Faribault; second vice president, Mrs. A. E. Sohmer, Mankato; third vice president, Mrs. O. E. Locken, Crookston.

We are proud to announce that at the National Auxiliary meeting in New Orleans in May, our past state president, Mrs. James Blake, was made president-elect of the National Medical Auxiliary.

Laura R. Baxter (Mrs. S. H.).

PROGRESS

Eye, Ear, Nose and Throat

SHARE OF CRYSTALLINE LENS IN OCULAR REFRACTION: Edward Jackson, M.D., Denver, Colo. (Trans. Amer. Acad. of Ophthal. and Otolaryng., 1931, p. 66). Since Young, 100 years ago, showed that the lens changed its shape with accommodation, little light has been thrown on the share of the lens in the static refraction of the eye.

It is impossible to get an accurate mathematical measurement of the refraction of the lens because of the continual growth of the lens and the formation of the fixed nucleus with a fixed refraction index. The only true measurement is obtained by determining the total refraction of the eye and subtracting the corneal refraction as obtained by the ophthalmometer. In the case of the latter, there are errors of 0.25D to 0.50D, depending on the operator's skill and the repose of the patient. In a study of 644 eyes, the spherical corneal refraction had not changed more than 1D in 626 eyes. Of 22 eyes in which there was a change of more than 1D, 12 showed an increase and 10 a decrease. The average age where an increase occurred was 32 while it was 41 where a decrease occurred.

The author assumes an increase of spherical corneal refraction in early life. There was a change of 1D. or more of corneal astigmatism in 44 eyes, mostly in young people. Only 3 cases over 50 showed such a change.

The greater mass of total refraction changes occurs after the age of 50. Of 76 such cases examined three to five times, there was no certain or material change in the corneal refraction but each required a number of changes of the total refraction, the average number of changes being 4.24 and the average time between changes being 4.0 years.

From these studies, in all the cases (644) except 22, the change of the total refraction was due to that of the crystalline lens. These changes occur at all periods of life. This series shows the practical importance of the crystalline lens in refraction of the eye.

Frank W. Stevenson.

PEDIATRICS

THE INCIDENCE OF RESPIRATORY INFECTIONS DURING THE FIRST FIVE YEARS OF LIFE: C. C. McLean, M.D., Birmingham, Alabama (Arch. Ped., Vol. XLIX, No. 5, May, 1932). The incidence of respiratory infections during the first five years of life should be of interest to the pediatrician as it comprises approximately 80 per cent of the acute illnesses in children of this age group.

An intensive study of 1,408 respiratory infections seen in 156 children is made in an endeavor to find evidence of a periodic recurrent disease. A small number of children are reported rather than a large group, so as to include only patients with whom they have been in intimate contact and feel reasonably sure were seen in practically all illnesses.

A comparison of the average number of respiratory infections per patient and the average number of months per each respiratory infection in the children with various groupings of the same age and length of observation, shows a marked consistency.

During an exact period of four years from the date of birth in 86 and 70 children, 692 and 563 respiratory infections were seen. The average number of days between infections in the two series were 181.4 and 181.5 days. The average number of respiratory infections per patient in each series was 8.04 infections. The per cent of mild and severe infections in the two series was the same, 41 per cent mild and 59 per cent severe.

Eight hundred forty-five respiratory infections were seen in 86 children observed for an exact period of five years from date of birth. The children were placed in two groups of 43 patients, one group having 416 infections, the other 429, a difference of 13 infections.

In 70 children observed for an exact period of four years from date of birth, 563 respiratory infections were seen. The patients were placed in two groups of 35 children, one group having 285 infections and the other 278, a difference of seven infections.

In 140 children observed for an exact period of four years from date of birth, 1,125 respiratory infections were seen. When the patients were placed in two groups of 70 children, one group had 563 infections and the other 562, a difference of one infection.

The monthly seasonal incidence of occurrences in 845 respiratory infections seen in 86 children observed for an exact period of five years from date of birth, compared with 563 respiratory infections seen in 70 children over an exact period of four years from date of birth, shows a marked consistency.

The removal of tonsils and adenoids apparently had little effect on either the number or severity of respiratory infections.

R. N. Andrews, M.D.

PSYCHIC ENURESIS IN NORMAL CHILDREN—AN EXPERIMENTAL STUDY: J. M. Lewis, M.D., and J. Ostroff, M.D., New York (Amer. Jour. Dis. Children, June, 1932, Vol. 43, No. 6). It would seem superfluous to stress the importance of psychic factors in the causation of enuresis in children. Enuresis has been and is an important problem, a fact that was brought out strikingly at the beginning of the study when the authors were able to find only eight children among forty, from 3 to 4 years of age, who did not wet themselves by day or by night. Four of the children were transferred from the main building to one of the small buildings, which is divided into fourteen individual glass cubicles, and were confined to their cubicles during the twenty-four hour period for an entire week. Within twenty-four hours after transfer to the small cubicles, enuresis developed in all these children, not only nocturnally but diurnally. As was to be expected, the children remained continent when transferred to their original wards.

The authors believe that enuresis was induced in these children by the psychic effect of a strange and new environment, and that in some children psychic adjustment took place within forty-eight hours. This interpretation is borne out by the fact that when the change in surroundings was not marked, as, for example, when they were transferred to a similar ward, incontinence did not result, and that if the change in environment had been previously made a second transfer resulted in a less degree of incontinence.

In this connection, the authors would like to call attention to the development of enuresis in some children when they were transferred to private homes. It has likewise been their experience that the development of enuresis in these children was of temporary nature, and they ascribed it to change of environment.

Enuresis must be regarded as a disorder that can be induced at will in some normal children and is thus open to experimental investigation. Psychic enuresis can, therefore, be induced and controlled experimentally, which renders it possible to study various etiologic and therapeutic factors that are commonly associated with this condition.

R. N. Andrews, M.D.

(Continued from Page 603)

in the neighborhood of Petersburg had for two or three years suffered from obstinate digestive disturbances. He had consulted a number of physicians, most of whom had diagnosed ulcer of the lesser curvature of the stomach or the duodenal cap. Finally he came under my observation and my diagnosis was that the cause of the ailment was an obstruction in the pyloric opening in the stomach. At my suggestion he submitted to an exploratory operation. We found the first part of the duodenum in a state of chronic inflammation with dense infiltration and masses of granulation tissue superimposed on the structure. The appearance was that of an advanced stage of carcinoma. While attempting to excise sufficient tissue for a biopsy, a hard object was suddenly encountered deep in the mass. Further search revealed that it was of considerable length. One end was isolated and the foreign body carefully extracted. It proved to be a piece of wood three and a half inches long, round, sharp pointed at both ends—an old-fashioned wooden toothpick. One end had penetrated the upper aspect of the pyloric end of the stomach, had entered the lumen of the duodenum, due to its upward turn, and the points had made an exit through the lumen of the gut, transfixing it in its journey from the stomach. The patient made a rapid and uneventful recovery only to be attacked by appendicitis a year later.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS JUNE 30, 1932

BY EXAMINATION

(June)

Name	School of Graduation	Address
Beecham, Clayton Tremain	U. of Minn., M.B., 1932	University Hospital, Minneapolis, Minn.
Bolender, Harold Leland	U. of Iowa, M.D., 1930	929 Selby Ave., St. Paul, Minn.
Bouquet, Bertram Jacob	Washington U., M.D., 1931	Caledonia, Minn.
Buckley, Clarence Harold	U. of Minn., M.B., 1932	Eitel Hospital, Minneapolis, Minn.
Bunker, Bevan William	U. of Minn., M.B., 1932	Rothsay, Minn.
Corwin, Warren Coons	Johns Hopkins, M.D., 1932	1625 W. 25th St., Minneapolis, Minn.
Fitzgerald, Edward Michael	U. of Minn., M.B., 1931; M.D., 1932	525 11th Ave. S. E., Minneapolis, Minn.
Foster, Robert Francis	Northwestern, M.B., 1929; M.D., 1930	603 1st St. S. W., Rochester, Minn.
Gilpin, Sherman Fulmer, Jr.	U. of Pa., M.D., 1929	Mayo Clinic, Rochester, Minn.
Grand, Clifford August	U. of Minn., M.B., 1931	St. Lukes Hospital, Duluth, Minn.
Haven, Walter Kirkland	U. of Minn., M.B., 1931; M.D., 1932	151 Malcolm Ave. S. E., Minneapolis, Minn.
Henry, Clarence John	U. of Minn., M.B., 1932	Foley, Minn.
Hill, Elmer Morris	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Hoffman, Malcolm Edwin	U. of Minn., M.B., 1930; M.D., 1932	588 Portland Ave., St. Paul, Minn.
Hospodarsky, Leonard John	U. of Iowa, M.D., 1931	New Prague, Minn.
Hoyer, Ludolf Julius	U. of Minn., M.B., 1932	2308 Logan Ave. N., Minneapolis
Ivers, George Urben	Rush Med. Col., M.D., 1932	Christine, N. Dak.
Johnson, Raymond Gregor	U. of Minn., M.B., 1931; M.D., 1932	123 7th St., Cloquet, Minn.
Kass, Isadore Harris	U. of Mich., M.D., 1929	St. Mary's Hospital, Rochester, Minn.
Knutson, Gerald Arthur	Northwestern, M.B., 1931; M.D., 1932	Buxton, N. Dak.
Kroning, Carl Gustav	U. of Minn., M.B., 1932	St. Mary's Hospital, Duluth, Minn.
Marble, Willard Pearl	U. of Iowa, M.D., 1929	1238 Second St. N. W., Rochester, Minn.
Nelson, O. L. Norman	U. of Minn., M.B., 1931; M.D., 1932	General Hospital, Minneapolis, Minn.
Rasmussen, Ruth Frances	U. of Minn., M.B., 1931; M.D., 1932	111 4th Ave. N. W., Rochester, Minn.
Ryan, George Harold	U. of Manitoba, M.D., 1929	Mayo Clinic, Rochester, Minn.
Schmidtke, Reinhardt Ludwig	U. of Minn., M.B., 1932	Receiving Hospital, Detroit, Mich.
Schwegler, Raymond Allen	U. of Minn., M.B.,1930; M.D., 1931	329 Union St. S. E., Minneapolis, Minn.
Thomson, James Myron	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Thoreson, M. C. Bernice	U. of Minn., M.B., 1931; M.D., 1932	888 Grand Ave., Apt. 304, St. Paul, Minn.
Waligora, Daniel John	U. of Minn., M.B., 1932	St. Mary's Hospital, Minneapolis, Minn.
Walker, Arthur Edgar	Marquette, M.D., 1932	1833 Vermillion Rd., Duluth, Minn.
Watterson, Gerald Treslar	Indiana U., M.D., 1932	St. Luke's Hospital, Duluth, Minn.

BY RECIPROCITY

Bryant, Frank Leytze	Jefferson Med. Col., M.D., 1927	3014 Hennepin Ave., Minneapolis, Minn.
Hand, Orra Robert	Washington U., M.D., 1930	3026 W. Lake St., Minneapolis, Minn.
Jordan, Donald Voorhees	U. of Ill., M.D., 1928	126 Oak Grove St., Minneapolis, Minn.
Murphy, Edward S.	Creighton U., M.D., 1916	University Hospital, Minneapolis, Minn.
Weiss, Leo Heinrich	U. of Tubingen, Germany Scientific Degree Dr. of Med., 1927 U. of Goettingen, Germany, 1924	Le Center, Minn.

RADIUM AS A "PATENT MEDICINE"

The recent newspaper reports of the death of a steel manufacturer and sportsman, due to radium poisoning, caused the public to ask: "Why do the federal authorities permit the indiscriminate sale to the public of dangerous "patent medicines"? The answer is that the National Food and Drugs Act gives the federal officials no power to stop the sale of dangerous nostrums. If no false statements are made *in or on the trade package* of a medicine that enters into interstate commerce and if the presence and amount of the eleven drugs and their derivatives that are mentioned in the national Act are properly declared on the label, the federal officials have no power to stop the sale of such products. According to newspaper reports, the death of the man was brought about by the continued use of "Radithor," put out by William J. A. Bailey of East Orange, N. J. In 1915 a newspaper reported that William J. A. Bailey had been arrested because of his activities in the promotion of the Carnegie Engineering Corporation. In 1915 the postal authorities issued a fraud order against the Carnegie Engineering Corporation. A few years ago Bailey was president and one of the incorporators of Associated Radium Chemists, Inc., New York City, which put out a line of "patent medicines," including "Arium," described as "radium in tablets." Bailey also was connected with the Thorone Company, which purposed to put out "Radium and Thorium Pharmaceutical Preparations." Then William J. A. Bailey, with one Ward Leathers, traded under the name, American Endocrine Laboratories, putting out the "Radiendocrinator," which sold for $1,000. Then came "Radithor," in the exploitation of which Bailey used the trade style, Bailey Radium Laboratories, Inc., sold in cases of thirty bottles for $30. The preparation was guaranteed to be "harmless in every respect." Bailey's next product seems to have been the "Bioray," supposed to give off "a continuous flow of gamma rays." The next excursion into the field of radioactive nostrums brought forth the "Thoronator," which was described as a "Health Spring for every Home and Office." Now we have the "Adrenoray," an alleged radioactive belt which is to be worn over the adrenals. (Jour. A. M. A., April 16, 1932, p. 1397.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Principles of Chemistry. Joseph H. Roe, Ph.D. 3rd edition. 486 pages. Price $2.50. St. Louis, C. V. Mosby, 1932.

An Introduction to Dermatology. Richard L. Sutton, Jr., M.D. 565 pages. Illus. Price $5.00. St. Louis, C. V. Mosby, 1932.

International Medical Annual. Editors: Carey F. Coombs, M.D., F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. 658 pages. Illus. Cloth. New York: William Wood and Company, 1932.

GROWTH AND DEVELOPMENT OF THE CHILD: Part III. Nutrition. White House Conference Publication. 532 pages. Price, $4.00. New York: Century Co., 1932.

Of all the investigations instituted by the conference of scientists which President Hoover summoned to study the problems of childhood, none appeals to this reviewer so much as does this volume. Here is included a complete, up-to-the-minute review of all the facts pertaining to the development of children. Without being excessively technical or prolix, the multitude of factors associated with nutrition and metabolism are interestingly presented. A rational survey of the latest facts on the various vitamins, as well as a consideration of the functions served by the various organic and inorganic food elements make this more likely to serve as a text on the subject. Numerous practical considerations, such as of protein and energy requirements; food selections for normal diets; the effects of cooking and preserving processes on various foods; and, particularly, of feeding habits in children, with reference to the vexing problem of anorexia, contribute to the value of this excellent study. This deserves a place in the library of all who are interested in the problems of childhood.

Thomas Myers, M.D.

AN EXPERIMENTAL AND CLINICAL STUDY OF PAIN IN THE PLEURA, PERICARDIUM AND PERITONEUM: Joseph A. Capps, M.D. 99 pages, $3.00. New York: Macmillan, 1932.

The value of an intelligent understanding of the subject of pain to the practicing physician cannot be overestimated. Therefore, the appearance of a monograph by one competent to cope with the subject is a timely and welcome one. The experimental methods used by the author in his study of the mechanism of pain in the pleura, pericardium and peritoneum are to be commended, and are important in that they not only confirm clinical observations which are generally accepted, but they also serve to demonstrate more accurately the localization of a lesion which is associated with a particular type of distress.

The separation of the types of pain found in affections of these serous cavities into visceral and referred pain is clearly demonstrated. A particularly valuable finding is the corroboration of Mackenzie's opinion that a dry pericarditis is usually a painless disease, the possible exception being the involvement of that portion of the pericardium which is supplied by the phrenic nerve and which gives a referred pain typical for that nerve.

This monograph is recommended to practicing physicians and medical students, who will, aside from the facts brought out, enjoy the excellent exposition of a sound experimental method.

Joseph F. Borg, M.D.

NUTRITION SERVICE IN THE FIELD. CHILD HEALTH CENTERS: A SURVEY. Publication of the White House Conference. 196 pages. Price $2.00. New York: Century Co., 1932.

This study consists of two parts, the first of which is devoted to the problem of malnutrition in children. It is estimated that over six million of our forty-five million children are malnourished. The need of efficient instruction in and regulation of children's diets by trained nutritionists is becoming recognized increasingly, particularly during the present depression. Studies of the procedures followed in many large dispensaries, schools and like institutions, which assist in overcoming malnutrition, are accurately detailed in this volume.

The second part of the book is devoted to a survey of child health centers, such as baby welfare clinics and the like. The value of such clinics in maintaining health in the children of the poor, has been long accepted.

Pediatricians, health officials and social workers will find this volume worth while.

Thomas Myers, M.D.

THREE GENERATIONS of experience in grinding, specializing in fine surgical instruments. Prices, reasonable. Schwarz Grinding Service, Foot-Schulze Bldg., 128 10th St. E., St. Paul. Telephone, Midway 9939.

X-RAY AND LABORATORY TECHNICIAN wishes position as doctor's assistant. 7½ years' experience. Recently completed business education. Address Miss Alice Kruger, 2417 Stevens Avenue South, Minneapolis.

FOR RENT—Well furnished and equipped medical office in Medical Arts Building, Minneapolis. Agreeable terms—part time basis. Address D-183, care Minnesota Medicine.

OPPORTUNITY for young medical graduate to take over active location as associate with general surgeon. Nothing to buy. References, please. Address D-184, care Minnesota Medicine.

FOR SALE—Desirable location on outskirts of Saint Paul, Minnesota, including office equipment. Reasonable terms. Address D-180, care Minnesota Medicine.

OFFICE SPACE FOR RENT—In central location of Minneapolis. Two rooms and share in waiting room with other physicians. X-ray and well equipped clinical laboratory with expert technician. $50.00 a month but will give a reduction while getting established. Well suited for eye, ear, nose, and throat man or internist. Address D-186, care Minnesota Medicine.

MINNESOTA STATE MEDICAL ASSOCIATION

Seventy-ninth Annual Session

Saint Paul, Minnesota

PROCEEDINGS OF THE HOUSE OF DELEGATES

First Meeting—Monday Morning, May 23, 1932

The opening session of the House of Delegates of the Seventy-Ninth Annual Session of the Minnesota State Medical Association, held May 23-25, 1932, at St. Paul, Minnesota, convened at nine thirty-five o'clock, Dr. M. S. Henderson, Rochester, Minnesota, the president, presiding.

President Henderson: The meeting will please come to order.

We have appointed a Credentials Committee consisting of Dr. A. B. Stewart, Dr. P. A. Lommen and Dr. H. M. Blegen. They should report. Is Dr. Stewart here?

Dr. A. B. Stewart: The Credentials Committee is pleased to report that thirty delegates from sixty counties handed in their credentials. If any are here who have not handed in their credentials, please do so. We ask to be continued with the privilege of reporting later.

President Henderson: There are sufficient delegates who have presented credentials to constitute a quorum, so I hereby declare the House of Delegates in session.

Our first order of business is to welcome any guests who are here. Do any of you have any guests with you? As they come in we will greet them.

The next order of business is the acceptance of the minutes of the last session as transcribed by the official reporter and published in full in the September, 1931, Minnesota Medicine. These are long and voluminous and it would take considerable time to read, and the Chair would welcome a motion to pass it by and have them accepted as published.

Dr. H. M. Workman (Tracy): I make such a motion, Mr. President.

Dr. F. A. Willius (Rochester): I second the motion.

President Henderson: It is moved and seconded that the minutes be acecpted as published. Is there any discussion?

The motion was put to a vote and carried.

President Henderson: The next order of business is the report of the Chairman of the Council, Dr. Workman.

Dr. H. M. Workman read his report as Chairman of the Council.

REPORT OF THE COUNCIL

The Council of the Minnesota State Medical Association met at 6:30 P. M. Sunday, May 22, at the Lowry Hotel, St. Paul.

The Chairman, Dr. H. M. Workman, presided.

The following were present: Dr. M. S. Henderson, Dr. H. M. Workman, Dr. H. Z. Giffin, Dr. W. A. Coventry, Dr. F. J. Savage, Dr. S. Boyer, Dr. W. W. Will, Dr. O. J. Hagen, Dr. W. A. Piper, Dr. H. M. Johnson, Dr. L. Sogge, Dr. E. A. Meyerding.

The Reference Committee, consisting of Dr. A. N. Collins, Chairman, Dr. O. E. Locken, Dr. R. V. Williams, Dr. W. C. Carroll, Dr. C. B. Wright met with the Council for dinner and discussed the reports of the various committees.

A committee representing the Minnesota State Masseurs' and Masseuses' Association presented their situation with regard to the desirability of establishing a school for the teaching of massage at the University of Minnesota.

Mr. J. R. Bruce and Dr. J. T. Christison, Chairman of the Editing and Publishing Comimttee reported on the amalgamation of Minnesota Medicine and the Journal-Lancet. It was left to the Council to take further action.

The minutes of the last meeting of the Council were read and approved.

The Secretary reported on the cost of the annual meeting to date, also the Commercial Exhibits.

The Secretary reported on the membership.

Dr. Savage gave a brief report on the finances.

Applications for Affiliate Memberships were considered.

It was decided by the Council to accept Dr. J. A. Malerich's application for membership in Houston-Fillmore County Medical Society.

The Secretary reported on the situation in Stearns-Benton County.

Delegates to the A. M. A. were nominated. Dr. H. M. Johnson, delegate; Dr. E. A. Meyerding, alternate. Dr. W. F. Braasch, delegate; Dr. W. L. Burnap, alternate.

The Secretary reported on the exchange of medical journals between Wisconsin and Minnesota.

The Secretary read a letter from Dr. J. M. Armstrong of the Editing and Publishing Committee regarding the Journal-Lancet.

The Secretary reported on correspondence with Ramsey County regarding bids on badges, et cetera.

The Secretary read correspondence regarding St. Luke's Hospital at Thief River Falls.

The Secretary read a letter from Dr. J. A. Cosgriff of Olivia regarding "Care of the Indigent."

The Secretary reported on the bond of Mr. J. Robert Bruce.

Dr. T. M. Johnson gave a report on the New Orleans meeting.

The Secretary read a letter from Dr. A. J. Chesley, State Department of Health, regarding White-House-Minnesota Conference on Child Health and Protection.

The meeting adjourned.

Dr. Workman: I move the adoption of the report.

The motion was regularly seconded.

President Henderson: Is there any discussion or corrections?

The motion was put to a vote and carried.

President Henderson: As the next order of business, I am going to ask Dr. Arthur Collins, Chairman of the Reference Committee, to discuss the Council reports.

Dr. A. N. Collins (Duluth): The Council reports from the First, Second, Third, Fifth, Seventh, Eighth and Ninth Districts were submitted. There were no comments recorded by the Reference Committee on these reports excepting the fact that the report of Ramsey County, Dr. Savage's report of the Fifth District, went rather deeply into the matter of program in this district. We held up our action for a few hours until we met with the Council, at which time Dr. Savage asked whether this conflicted at all with the state program, and we said it did not. So that was approved.

You may have one of the first drafts of the report of the Eight District, Dr. Hagen's district, but there is a central paragraph of the Red River Valley Society which has been stricken out of his report. Otherwise, the reports of the Councilors were accepted.

President Henderson: You have heard the comments of the Reference Committee. Have any of the individual Councilors concerned anything they would like to add or say? We would like to hear from you if you have

The next order of business is the report of your President. I am not going to say much. You will have to listen to me on Tuesday night. The By-laws say the President must deliver an address, so I have to and you will have to listen then. However, I wish to assure the House of Delegates of my appreciation of the opportunity to serve you as your President. It has been a great pleasure to meet the men around the state and I have a deeper appreciation than ever of the worth of the men in the State Medical Association. I would like to pay tribute, too, to the men who have worked so well on the committees, one and all, for they have shown great willingness to give of their time freely, and oftentimes at a sacrifice to come to the meetings, and I think we are really accomplishing something.

I thing the Committee on Scientific Assembly particularly has been busy this year. We had a number of meetings early in the year, usually on Saturday nights when most men might want to stay home with their families or gather around with some friends on convivial occasions, but they have given that up and come to these meetings, and the meetings lasted late into the night, and they went home then to carry on correspondence and assemble this program that I think you will agree is certainly varied and entertaining.

Dr. Meyerding and Dr. O'Brien have been very valuable, and Dr. Donohue in St. Paul. I should just like to bring one thing to your attention, that the Committee on Scientific Assembly changes its entire personnel practically each year, so that the question of continuity falls pretty heavily on the shoulders of our Secretary. He has to sit in at those meetings and sort of line us up and head us in the right, and this year with the assistance of Dr. O'Brien, I think we are ready to get down to business and do things expeditiously and not waste too much time. I think there is some need for the establishment of a continuity in that committee, some rotating membership.

I have endeavored to visit the different societies around the state and have appreciated the opportunity to meet the men, and I will be glad to attend as many society meetings as I can, but I think the Councilor of each district should attend these meetings also for I think it helps to keep up interest in the Society.

I suppose the balance of the year, of course, will go on without much excitement. The legislative elections are this fall, and I think our Legislative Committee will keep us informed as to who the men are that we should vote for, men who are friends of the medical association, and while we cannot do any out-and-out campaigning, I think it is up to us to watch the personnel of our legislative body.

The next order of business is the report of the Secretary, Dr. E. A. Meyerding.

REPORT OF THE SECRETARY

The year of 1931 has been distinguished by the influx of inquiries and activities on the part of various committee chairmen. This sudden increase in the amount of office work is undoubtedly due to the fact that greater time has been available for the consideration of these matters.

The demand for information and service is of a type that is more complicated than formerly. The local societies and groups of doctors are studying certain problems and require a great deal of intricate and special information.

COMMITTEES

The committees have, as a whole, been somewhat more active than in previous years. You will agree that the Scientific Program Committee for 1932 has undoubtedly created the best annual meeting in our history. The Public Health Education Committee has followed out the suggestions submitted a year ago in that it has subdivided itself into several sub-committees consisting of the Executive Committee, Liaison Editorial Association Committee, Liaison Heart Committee, Liaison State Health Relations Committee, Committee on Child Welfare, Editorial Committee, Eye, Ear, Nose and Throat Committee, Committee on Speakers Bureau, and Tuberculosis Committee.

NEWSPAPER SERVICE

This service is being accepted as in the past, and we believe it is becoming more valuable all the time. The total number of papers accepting this service is 300. It is urged that members ask their newspapers why they do not publish these stories, if they do not, and when the stories do appear, that they congratulate the editor.

STATE BOARD OF MEDICAL EXAMINERS

A close contact has been kept with the Secretary of the State Board of Medical Examiners and the Basic Science Board. Frequently communications come into this office that must be referred to the Board of Medical Examiners, and requests for information from them are furnished regularly. We wish to express our appreciation to the State Board of Medical Examiners, its secretary, and staff.

COMMITTEE ON HOSPITAL AND MEDICAL EDUCATION

This committee has been active in the past year in furthering the Short Courses. The Short Courses are holding their own, and it is a great compliment to the profession of Minnesota that so many of its members are interested in this means of scientific advancement.

THE PRESIDENT

President M. S. Henderson is likely to hold the record over all previous presidents for attendance at county medical society meetings.

Doctor Henderson has been very active in the conduct of his office, having made more personal contacts with the membership, already, than many of his predecessors.

PAST PRESIDENTS

For a long time it has seemed a great waste to lose abruptly the services of the men who have served as presidents at the expiration of their short terms. A good deal of thought has been given to the subject as to how to take advantage of the knowledge and experience attained by a member who has gone through the various offices culminating as President.

It is suggested that there be added to the Council four additional members consisting of the four past presidents whose terms have last expired. We believe that in this way we shall retain this all-valuable service of the men who know most about our program, history and precedents established.

SEVENTY-EIGHTH ANNUAL MEETING IN MINNEAPOLIS

This meeting was successful in practically every respect. It was apparent that the meeting place was not quite large enough. The local committees were very cooperative and very hospitable. The total attendance was 896, the largest attendance ever held by this organization, in contra-distinction to other organizations who at that time had been falling off everywhere from 25 to 50 per cent of their regular registration.

HEADQUARTERS

The present arrangement of coöperation with the Minnesota Public Health Association continues to be of equal importance to both organizations. Their publication, *Everybody's Health,* is conducted on as high an ethical plane as possible, to their financial loss. We will leave it to the medical profession to keep in mind and further the program of the Minnesota Public Health Association as much as it can. The profession should keep always in mind, also, the value of a publication such as *Everybody's Health* which goes to every school, hospital, library and to many homes throughout the state, and which not only is ethical, but constantly carries on a program to create goodwill toward the practicing physician.

HEALTH MEETINGS

Speakers have been sent out by the Public Health Education Committee to various parts of the state and to various organizations, such as the Parent-Teacher Associations, Women's Federation, et cetera. Health meetings were also conducted, in conjunction with the Minnesota Public Health Association, in various parts of the State.

STATE SECRETARIES' CONFERENCE

The largest and most interesting Secretaries' Conference in the history of the association convened at the Saint Paul Hotel, January 23, this year. Three main subjects of very vital importance to the future of medicine in America occupied the largest share of the day and held the majority of the delegates for discussion long after the scheduled hours of adjournment. These subjects were "Medical Care of the Poor"; the "Periodic Medical Examination" and "Medical and Hospital Care for Veterans." Nine states including Minnesota, Wisconsin, Illinois, Iowa, Nebraska, Wyoming, North and South Dakota and Michigan were represented at this meeting and at the Northwest Regional Conference which occupied the Sunday following.

REGIONAL CONFERENCE

An informal exchange of views and policies between officers of all nine organizations marked the Regional Conference which annually follows the secretaries' meeting. Public Health Education, Medical Group Advertising, Medical Care of the Poor, Public Relations and Veterans' Care were among the subjects discussed.

MEDICAL CARE OF THE VETERANS

Your Secretary was appointed a member of the Auxiliary Committee of the American Medical Association to study this question. He traveled with the chairman of the committee, Dr. C. B. Wright, to Chicago, Indianapolis and Washington several times, and sat in at the various conferences. Minnesota can be justly proud of the active part it has taken in this great movement for better health protection for those who made their sacrifice to safeguard our nation.

Your Secretary also assisted Drs. Theodore Sweetser, H. R. Tregilgas, C. B. Wright and N. G. Mortenson in framing a resolution to be suggested for passage by Minnesota Legion Posts, urging the liberalization of the law to permit medical and surgical emergencies of veterans to be cared for in civilian hospitals. The resolution is similar to others passed by a large number of Posts in other parts of the country, including some of the 40 and 8's.

RADIO PROGRAM

Dr. W. A. O'Brien entered his fourth year of weekly broadcasts on health under the auspices of the state association this year. The steady popularity of these talks is attested by the volume of mail that continues to come in in response. Their widespread educational value is beyond question.

AUXILIARY

Your Auxiliary is taking a leading place in organization, membership and enlightened program among all of the auxiliaries affiliated with the American Medical Association. As an invaluable agency of public health education it merits the most cordial and interested support on the part of the medical profession.

FISCAL YEAR OF THE COMPONENT MEDICAL SOCIETIES

The membership of the component societies has kept up remarkably to the standard of last year. In April there were only about 30 less members than the post-meeting total for 1931. Undoubtedly, the post-meeting total for this year will equal, if not exceed, the last. The continued strength and effectiveness of our association will depend, of course, upon the continued enrolment of new members in our ranks.

AMENDMENTS TO CONSTITUTION AND BY-LAWS

It is proposed this year that Articles VI and IX be amended to allow the past presidents for four preceding years automatically to become members of the Council. According to the proposed amendment, these men would serve for the four ensuing years, so that, besides the president, the councilors from the regular districts and the secretary and treasurer serving ex-officio, there would always be four additional members.

NEW SOCIETY

An important consolidation of two large societies has marked the year. The Chisago-Pine County Medical Society united with the Central Minnesota Medical Society under the joint name of the East Central Minnesota Medical Society.

ROSTER TO PROBATE JUDGES

The roster was sent to members in each county seat with the request that they give it personally to the Judge of Probate of their counties. In response to a questionnaire from the state office these members reported a vast majority of the judges of the state to be friendly to organized medicine and the state association. A few appeared to be indifferent. Three of these were reported in their dotage and generally unresponsive. Three others were reported as occasionally calling on members for testimony in their courts. No active opposition was reported from any quarter.

THE 1932 MEETINGS

The following extract from Dr. Locken's report of the recomendations of the Special Committee to Study the Policies of the state association was passed by the House of Delegates last spring:

> "That all arrangements for the Annual Meeting shall be handled by the State Central Office and by the State Committee with the exception of such matters of entertainment as the local host city is prepared to give. That income from commercial exhibits go to the State Association and that it, in turn, correspondingly assume expenses for the meeting."

As indicated by the above, the Commercial, Scientific and other Exhibits were placed in the hands of the Secretary's office this year. These duties have added considerable to the work of the Secretary's office.

1932 was not a good year to make a showing with commercial advertisers. Great difficulty was encountered in selling space because of the curtailment in advertising budgets of many business firms. We believe, however, that this arrangement has been conducive to the development of our educational program and that, eventually, it will be to our financial advantage as well.

The 1932 program is obviously a marked departure from the programs of former years. Its success, if it is successful, will be due in great part to the centralization of activities. The members will be able to judge for themselves.

RECOGNITION OF MINNESOTA'S SUPERIORITY

Minnesota medical men are being recognized more and more by national medical organizations. You will find many of them presidents and officers, also chairmen and members of important committees. In our own American Medical Association, we have the President of the Association, the Chairman of the Legislative Committee, the Chairman of the Reference Committee, not to say anything of the numerous officers in the various sections. One can be justly proud in any medical group to say, "I am from Minnesota."

There is no question in our minds that the progress that has been made in regard to curtailing the activities of the U. S. Veterans Bureau in their hospital building program would never have been successful if the Minnesota medical profession had not been prepared, through their experience in legislative matters, to advise and assist our national organization.

CONCLUSION

No Secretary's report is complete without proper acknowledgment of the work of the County Society officers. Holding office efficiently in a county society, especially that of county secretary, entails accurate bookkeeping, conscientious reporting of dues, meetings, and deaths, an executive ability and a prodigious fund of tact and affability, all of which seemed happily combined in those who served during the year 1931.

Our observations lead us to believe that the medical profession of the State of Minnesota compares favorably with other states. Our members are more active, better informed and more efficient in carrying out not only scientific, but many medical and social problems.

Secretary Meyerding: Mr. President and gentlemen: The report of the Secretary, as all of the reports, has been sent to every delegate. Therefore, we will not read the report here except such parts as we wish to emphasize and bring up such supplementary matter as we may have.

I would like to read this paragraph: "There is no question in our minds that the progress that has been made in regard to curtailing the activities of the U. S. Veterans Bureau in their hospital building program would never have been successful if the Minnesota medical profession had not been prepared, through their experience in legislative matters, to advise and assist our national organization." If it be true (and it is already apparent) that the building of federal hospitals for veterans will be curtailed, you can feel that the glory belongs to you for initiating and carrying out most of the part that has been successful.

I also want to call your attention to this meeting. We are at the cross roads in our annual meeting. This year we are in a new type of meeting. It is for you to say whether we shall continue with this type of meeting or go back to the type we had before. I will explain.

You have seen your program. It is a much broader and extensive program than we have ever attempted before. You find we have from three to thirty different subjects going at once. Just remember that that costs money. When we had one meeting hall we required one reporter, and proportionately the expense was so much less. The minute you have other additional meetings at the same time your expense goes up. It doesn't double or triple each time, but it goes up in proportion.

We also have inaugurated what we call our technical exhibits, downstairs. That is a mixture of commercial and scientific exhibits. If we are to continue this, it will be necessary that we have meetings in places where we can have proper housing facilities, and they are not available in every part of the state. If you think this is the type of meeting that you want, you should vote on it at your Tuesday meeting tomorrow and consider where the meetings go, so that we shall have facilities.

I think more power should be given to the committee that works throughout the year. This year it was Dr. Savage and myself, I believe, and we called the President in. It should be similar to the system in the A. M. A., so that we can turn down a place if they cannot provide the facilities or do not give us what we think we should have. It has cost us a little matter of $500 that we didn't expect in St. Paul due to the fact that they insisted on our paying for the space we sold. That sounds sort of reasonable. If we are going to make some money we ought to pay for it. Personally, I think we are enough of an inducement to any city that they could give us the necessary space. It would not amount to $500. It might amount to $300 or $200, but I believe they should have given us that space.

Those are things which I mean might come up, and your committee should have the power to select a place or change the place if necessary. I think if we had had that power we would not have had to pay for the space we sold downstairs.

I asked you please to consider this meeting. You will get a better idea by tomorrow morning, because the sessions open this afternoon. If that is the type of meeting you want we should very carefully consider where the meetings go. The meetings with the exhibits are costing us less out of our treasury than they did previously. This is an unusually bad year from an economic standpoint. It is very difficult to get commercial exhibitors, not only because of economic conditions but for other reasons. One group combined not to exhibit with the Minnesota State Medical Association any more. The optical people got together and refused to exhibit with us for reasons they had or believed they had. So inspite of that, this meeting, which is much greater than any we have ever had, is costing our treasury less. I hope you will consider this matter carefully.

Personally I believe the only place you can have a real meeting is in St. Paul. We have an auditorium here that is better than any other in the state. It is possible we might have the meeting in Minneapolis with great difficulty. Thank you.

President Henderson: It probably is not necessary to tell you that Dr. Meyerding was born in St. Paul and he never got over it.

You have heard the report of the Secretary. What shall I do with it?

Dr. Workman: I move its adoption.

The motion was regularly seconded.

Dr. A. G. Schulze (St. Paul): The Secretary's report as presented to the delegates includes a great deal more than was given from the platform. On the second page there is this paragraph under "Past Presidents": (Perhaps it isn't necessary to read that, except the second paragraph.)

"It is suggested that there be added to the Council four additional members consisting of the four past presidents whose terms have last expired. We believe that in this way we shall retain this all-valuable service of the men who know most about our program, history and precedents established."

I think that is very true. Perhaps there is nothing that is truer.

In the paragraph preceding the one I just read, it is given that the purpose of this is to not lose abruptly the services of the men who have served, at the expiration of their short terms. The idea is to retain these men for a period of four years longer, to give of their wisdom and of their judgment to the Council. I think that is very good. The Councilors now consist of the nine Councilors, together with the President, the President-elect and the Secretary and Treasurer as ex-officio members. We add four more to that, which makes thirteen, and with the officers, the President, President-elect, Secretary and Treasurer, it is seventeen.

Personally I feel there is more and more of the business of the Association taken out of the hands of the delegates and placed in the hands of the Councilors. That may be all right, but there is a limit to it, I think. I am very willing to vote for that clause, but with this amendment: "That these past presidents be regarded as advisory members of the Council." The Council is composed of three bodies, we will say: the Councilors, one man from each of the nine districts; the officials, which are the President, President-elect, Secretary and Treasurer, ex-officio; and now the four past presidents who shall be the advisory members, we will say. But I would amend it to the extent that these men be without a vote in the Council or in the House of Delegates, serving purely as an advisory committee.

President Henderson: I might call on Dr. Collins as chairman of the Reference Committee, who might comment on this. This has all been gone over by the Reference Committee and I think we will embody the things we speak of.

Dr. Collins: When we come to take up the various amendments don't you think the discussion will be on these particular points?

President Henderson: This report of Dr. Meyerding is merely a report, and these things mentioned in it will come up as we go along in the ordinary run of business, and I think you will find this will be taken up by the Reference Committee, Dr. Schulze.

Dr. Schulze: That is perfectly all right. I thought you were about to call for the adoption of the report.

President Henderson: I have to call for the adoption of the report, but it doesn't change the Constitution in any way.

Dr. W. A. Coventry (Duluth). The report is just an opinion on the part of the Secretary and is not binding on this body until adopted as a binding part of our Constitution. Just to adopt the report is simply adoption or receiving his recommendations and taking them for what they are worth.

The motion was put to a vote and carried.

President Henderson: Report of the Committee on Public Health Education, Dr. Critchfield.

REPORT OF THE PUBLIC HEALTH EDUCATION COMMITTEE

The Committee has developed this year from a large, somewhat unwieldy organization, in which (of necessity) a few did the work for the entire body, into a group of small working units.

This, in the opinion of the Chairman, is an important step in advance which the ever widening scope of the committee's activities has made necessary. It will facilitate all of the work of the committee. It will involve all members in a responsible direct part in the work and much more closely than formerly bind its facilities to other committees of the state association.

The Committee on Public Health Education as now constituted is made up of an Executive Committee including chairmen of all the committee sub-divisions; an Editorial Committee, an Eye, Ear, Nose and Throat Committee; a Committee on Speaker's Bureau; a Tuberculosis Committee; and a Committee on Child Welfare. In addition there is a Liaison Editorial Association Committee; a Liaison Heart Committee; a Liaison State Health Relations Committee. These liaison committees are designed to coöperate actively and closely with corresponding committees of the State Association in all the phases of their work that concern education of the profession or the public.

EXPENDITURES

We are presenting a financial statement that shows various expenditures under definite heads. Where expenditures are listed to accounts that are not primarily the function of this Committee, they were charged at the request of the Council. Our total annual budget expenditure is therefore a financial statement of the activities of our committee plus certain other outlays especially voted by the Council.

FINANCIAL REPORT

1931 Analysis of the Public Health Education Expenditures

News Service	$1,268.78
Legislature—Hygeia & Everybody's Health	315.25
Stenographer	715.00
Radio	406.61
Miscellaneous Postage and Printed Matter	69.48
Speakers	66.00
Meetings—Public Health, Med. Econ., County Society, Officers Conf. P. T. A., Public Health Nurses, etc.	144.49
Sundries, Petty Cash, Telephone & Telegrams	13.14
Reprints of Public Health Education Paper read at A. M. A.	45.27
4-H Club Examination	70.50
4,000 Health Posters	72.00
Total	$3,186.52

NEWSPAPER SERVICE

The weekly newspaper service conducted by our Committee reaches 300 newspapers in the state. It receives the endorsement and commendation of the Minnesota Editorial Association. Thanks to facilities offered by our alliance with the Minnesota Public Health Association the service continues to be prepared and sent out from the State Office. The Editorial sub-committee of which Dr. H. F. Helmholz is chairman carefully censors and revises each bulletin bearing our endorsement.

MEETINGS

Medical Economics Meetings, Public Health Meetings, County Society Meetings, Conferences, Public Health Nurses' Meetings.

Various members of the association spoke at meetings of the above character in different parts of the state. Their travelling expenses for these trips were paid by this Committee.

STENOGRAPHER

The Committee has paid only a share of the salary of one employee at the State Office this year in place of assuming the entire charge as formerly. In accordance with the new pro-rata arrangement inaugurated in 1931 the salary is now distributed in accordance with comparative services rendered.

SPEAKERS' LIBRARY MATERIAL

The Speakers' Library is in almost constant demand by members with public health talks to give in every part of the state. Material for this library is collected from periodicals, government printed material, current publications of all sorts as well as popular new books. It is available to all members at any time.

RADIO

The Committee wishes to congratulate both itself and Dr. O'Brien on the continued popularity of his weekly radio talks, which are now in their fourth year on WCCO. This series is undoubtedly still the most popular public health feature in this section of the radio world. Incidentally, abstracts of the talks appear each month in *Everybody's Health,* Minnesota Public Health Association publication, and are supplied through the latter to all radio listeners applying for them.

LEGISLATURE—HYGEIA AND EVERYBODY'S HEALTH

As in former years we have sent *Hygeia* and *Everybody's Health* during the past year to all members of the Minnesota State Legislature.

REPRINTS OF PUBLIC HEALTH EDUCATION PAPER READ AT CHICAGO

This paper, given by Dr. E. A. Meyerding at the 1931 Secretaries' Conference in Chicago, was in fact a complete outline of the history and operation and aims of this Committee. It had the assistance and endorsement in its preparation of the Minnesota leaders who organized the committee and the public health work of the association. Reprints of it have been found useful not only to send to other states interested in our form of joint organization with the public health association but for the education of our own membership and of public health officials.

4-H CLUB EXAMINATION

Close to 200 boys and girls, members of 4-H Clubs in Minnesota, were examined last fall at the joint headquarters of the State Association and the Minnesota Public Health Association, with the object of picking the healthiest and best developed to represent Minnesota at a National contest in Chicago. A very complete, well organized examination was given these boys and girls by 10 specialists under the direction of Dr. Meyerding. As a whole they were a group of fine physical specimens doing credit to the practitioners throughout the state who had selected and in some cases, assisted to groom them for the contest. The Committee considers the contact with 4-H Club members and their directors and officials a very valuable one for physicians. An important avenue for future public health work and future contacts was undoubtedly established by this examination.

TUBERCULIN TESTING

The Committee has coöperated wherever possible with the program of tuberculin testing of school children carried on by the Minnesota Public Health Association this year. We heartily endorse this program not only as an essential step in the eventual control of tuberculosis but as a valuable aid in the education of the public to the importance of the repeated physical checkup by the family physician. These testing programs have brought to the doctor's office many a child who might otherwise never have reached there until too ill to be helped.

PERIODIC MEDICAL EXAMINATIONS

New diagnostic tools such as the Schick test, the Tuberculin and Wassermann tests, that modern medical science is constantly putting into our hands have created a new demand on the part of the lay public for the periodic medical examination. Great public health educational campaigns in Heart Disease, Diphtheria, Tuberculosis, and Cancer have contributed to the demand. In our own state the recent epidemics of influenza and poliomyelitis have multiplied the numbers of such campaigns in recent years. The result has been a growing demand, also, for medical follow-up.

The promotion of this essential corollary to modern preventive medicine is rightly the business of this Committee. We have assisted through our regular channels in the education of the public to this essential health habit. We have also led in the equally essential education of the physician in the proper scope and aim of this comparatively new phase of medical practice which is the obvious foundation of the medical practice of the future.

HEALTH POSTERS

Four thousand Health Posters of unusually effective design were purchased and distributed during the year in schools, public waiting rooms, factories, and shops.

One bore the legend over the picture, "He who treats himself has a fool for a doctor." Two thousand of these posters were distributed.

The other was a vivid, well colored picture of Chanticleer crowing at dawn carrying with it an appeal for proper hours of sleep and healthy vigorous living. Two thousand of these were distributed also.

HEART WORK

Education in heart work has a two-fold aspect. The Committee deems it an important part of its work, now and in the future, to facilitate as much as possible through its Liaison Heart Committee, the work of the State Heart Committee. Speakers for County medical society meetings, selected by the Heart Committee, have been and will continue to be booked through this Committee for the furtherance of the general association heart program. This phase of the program is regarded as especially important. Public Health Education in matters of heart disease and prevention is carried on through the usual channels according to the discretion of the Editorial Committee.

MENTAL HYGIENE

The increasing interest in mental hygiene is being shown by lay and medical groups. In order to lead in advancing this particular phase of preventive medicine, members of this organization must keep themselves in touch with the progress made by leaders. We must be prepared to offer intelligent advice regarding management of behavior problems of both normal and abnormal children.

Undoubtedly a very high percentage of anti-social behavior of adults can be prevented by correct management during childhood.

TALKS BY THE CHAIRMAN

Your chairman has spoken before the Committee Chairman's meeting of February 29; before the Public Health Nurses, March 22, at the University, and before the Washington County Medical Society, April 12, since he took office in February of this year.

LAY HEALTH GROUPS

Your Committee has continued to forward the policy inaugurated some years ago offering its counsel and coöperation to lay health and other interested groups. In pursuance of this policy we have furnished speakers for the Annual State Meeting of the Parent Teachers' Association; to Federated Club Meetings; to American Legion Posts; Public Health Nurses' Meetings; the Minnesota Editorial Association; the Conference of Social Workers and many similar groups.

The importance of our contact with the Minnesota Public Health Association cannot be over estimated and we wish to congratulate and commend all of our members for their coöperation in cementing this contact all over the State. Theirs is the credit for the good feeling which exists everywhere between lay members of the Minnesota Public Health Association and their medical associates.

CONCLUSION

The obligation of the medical profession to assume leadership in public health activities and public health education becomes more urgent with each passing year.

The Committee feels that its work is of the utmost importance to the welfare of the association and that money is well spent on behalf of these activities.

Dr. L. R. Critchfield (St. Paul): I have a very brief addition to my report. The work of this committee has been facilitated very much by the fact that we have almost a unique situation. The association between the state association and the state public health association is very close. The executive offices come together.

By using the organ, the magazine, *Everybody's Health,* this committee has been able to further public health education very considerably. There have been some attempts from various parts of the state to possibly disintegrate this Association, and I have not embodied in my formal report anything about this, but I thought I would like to bring it up on the floor. We are in hopes that the members of this body particularly will use their influence to further continue the agreeable and active association between the Minnesota Public Health Association and the State Medical Association.

This committee has been given a very great impetus. A fine piece of work has been done by our predecessors on the committee, and we hope we will be able to continue, but we feel it is absolutely essential that the physicians throughout the state understand and know something about the program and be willing to engage actively in furthering it. We feel the physicians should make it a business to be active in their local public health associations in order to keep up their relationship. You doubtless know (if you don't you should be informed) that there are plenty of agencies just reaching out, anxious to take charge of and control public health education. Just recently one of the groups of the state, the Optometrists Association, have been able to put half-page advertisements in the Parent-Teacher Association Magazine. They are anxious to get hold of that part of public health education. The laity are just eager to get all the information possible. That makes it easy for our organization, if we will take charge and remain in charge as we should, because we have instituted all medical progress. So I am just presenting this outside of my formal report.

President Henderson: Dr. Collins.

Dr. Collins: The Reference Committee has considered the report of the Public Health Education Committee. Included in this report is the itemized account of expenditures for 1931.

We accept this report and recommend its acceptance by the House of Delegates.

The Reference Committee wishes to congratulate the Association and Dr. O'Brien on the continued popularity of his weekly radio talks, which are now in their fourth year over WCCO. These talks are undoubtedly the most popular public health feature in this section of the world.

Dr. Meyerding read a paper at the Secretaries' Conference in Chicago, in 1931, outlining the history, operation and aims of the Public Health Education Committee. This report was well received. Reprints of this paper have been found not only useful to other states interested, but for education of our own membership and other public health officials.

The program for the tuberculin testing of school children is endorsed in the report as an essential step in the eventual control of tuberculosis; also as an aid to public education regarding tuberculosis. These testing programs have brought to the doctor's office many a child who might otherwise never have reached there until too late to be helped.

Education in heart work has been stimulated through the work of the Speakers' Bureau of the Heart Committee, and will be continued throughout the coming year. This phase of the heart work program seems very important.

In conclusion, the Reference Committee would like to commend the splendid work of the Public Health Education Committee on such a small expenditure of money. Many states spend three or four times as much on this type of work. It should be considered one of the most important parts of the work of the state association.

President Henderson: You have heard the report of the Reference Committee. We would like to have discussion of these things. Is there any discussion?

Secretary Meyerding: Your liaison with the Minnesota Public Health Association and the Christmas seal organization has been going on for the past seven years, approximately. Personally I think that is all-important as a great factor in making your state medical association what it is today. Today you practically control medical leadership, or rather the health work is conducted by medical leadership. That is not true in most states. Lay leadership is frequently most prominent, by which I mean interested laymen such as social workers. We have that in this state also, the group who also desire to assume that leadership, but due to the strong character we had in Dr. H. Longstreet Taylor, that never came about. Unfortunately Dr. Taylor has passed away, and we are beginning to feel the attempted advances being made by other groups.

I think the medical profession has a greater influence in that it is so closely allied with this organization. I will mention just one part of the program of the Public Health Association and that is this little magazine. There are plenty of copies downstairs for you to take, and I hope you will take the last two numbers and look through them. That will be enough to say about this one part of their program, which probably takes approximately one-fifth of our budget of the Public Health Association and for which you pay not one cent from your dues. Just look through the journal and see the type of material that goes to every school, every hospital. In St. Paul alone there is a circulation of over 3,000. Every doctor's and dentist's office, every reading room, every library, every place where there is a group, gets that journal at no expense to you.

I forgot to say something previously in my own report that I heard on the way to New Orleans that will be of interest to all of you. Mr. Crownhart, Secretary of Wisconsin, said he would come this morning if he possibly could, but I do not think he can make it. In Wisconsin they have an income tax, and the records of the income tax are filed in each county. The State Medical Society, in studying their problems, decided to make a survey of the incomes of the doctors in Wisconsin. They could get a more accurate survey there than any other place in this country. They hired some individuals, I believe they were connected with the University of Wisconsin, who went to every county and got the reports, with the result that they know in Wisconsin today that the gross income of the medical profession of Wisconsin is $17,500,000 for the year 1931.

You are unable to get that information in Minnesota or any other state that I know of. Mr. Crownhart is a layman, an ex-newspaper man. He said, "You know these doctors don't pay anything for protection. The dues they pay to their society to protect the $17,500,000 worth of business is just exactly seventeen ten-thousandths of one per cent." That is what the medical profession of Wisconsin pays to look after its business, such as legislative, public contact, and so forth.

The same thing applies in Minnesota. We are approximately the same size, but I think we do at least twenty-five per cent more medical business, so we probably are paying a little less than they are. We are better organized than Wisconsin, and the reason for that is that we have this contact with this organization and can control various lay health activities.

I want to commend Dr. Critchfield for the splendid work he has done. He has a big job on his hands and he divides his committee into subcommittees. He is the whole medical association himself with his committee, apparently. They are all working and doing a splendid piece of work.

Here is the Parent-Teacher Association. I wager fifty per cent of you belong to it. I belong to it myself. Yet we cannot control our state publication which goes to every parent-teacher member in the state, to keep it from placing ads of the type spoken of. The optometrists have been running a two-column ad in that publication for a long time, and we get letters from all over the state complaining about it. We cannot stop it. I don't know how to stop it, unless the Auxiliary get in and run the P. T. A. like you are running the M. P. H. A., the Minnesota Public Health Association, today.

President Henderson: Is there further discussion?

Dr. H. M. Johnson (Dawson): Mr. President and Members of the House of Delegates: I would like to say a few words in regard to that, because one of our greatest troubles in the earlier days of the state medical association was that we had so many different health groups. There was no way to control them. They had this, and they had that, all over the state, one kind of clinic under one head, and one kind of diagnostic center under another head, and it was simply beyond anybody's control. It was controlled by laymen and they had no respect or regard for the medical profession, no matter where they were.

I want to say this: Out in the country, the doctors got so disgusted, so entirely disgusted with this kind of clinics and advisers that were sent out without the consent or advice of the medical authorities at all, that they felt like throwing up the whole state medical association.

One of the first things that had to be done to get the state medical association on its feet was to devise some ways or means whereby these different organizations could be made to work under one head, and that head to be controlled more or less by medical men. After due consideration and a good deal of study, this Public Health Committee was finally devised. It was appointed before we really had a right to do it, but it was an emergency measure and has worked out fine.

I want to say this to you: If we let anybody encroach on the funds for the Public Health Association in its local activities, it cannot be controlled. That will be spread and women here and there all over the state are going to tell the doctors what kind of clinics they want and how they want the money spent. It cannot be controlled locally. It simply has to be controlled from one head. Everything has to go into the Public Health Association, and through the connections that they have now with the state secretary and other men in the public health work. It has been working fine. I don't think there is any state in the United States that is so well controlled, and so far advanced in public health work, under the control of the medical profession, as this state. I want to say the happiest combination that has existed and can ever exist is when we can have a secretary of the state association and also of the Public Health Association who can work hand-in-hand and get these things controlled. If we do not, they are going to run us. You can just make up your mind to that. You know what that will be, if the laymen are going to dictate the public health policies of this country.

I hope everybody will take it upon himself to see that the Public Health Association is supported as a unit. There must be one center of activity and that must be guarded and guided by the men at the head of it.

I think the Public Health Committee as a whole has done wonderful work. It was a hard thing to start, but great credit goes to all the members on the committee, especially the various chairmen, and I hope the work can and will go forward in the same splendid and advancing way as it has.

Dr. George Earl (St. Paul): It has been a great pleasure this year to have had a place on this Public Health Education Committee under Dr. Critchfield, after having been chairman some five years.

On the one hand, in the question of health relations, we have organized medicine, which means we of the Minnesota State Medical Association are expending, as was quoted here today, an infinitesimal sum in order to influence the question of health and in order to influence the relationship of us as practicing physicians on the question of health.

On the other hand, we have organized and unorganized forces also trying to influence the question of health. Witness Macfadden's Magazine, witness the anti-vivisectionists and anti-vaccinationists. Witness the honest, sincere, but misguided influences such as the Christian Science church. Witness the constant lobbying that is put in at every legislature in behalf of naturopaths and what-have-you.

I do not hesitate to mention economics because Benjamin Franklin is the authority for the saying that economics or economy is the root of all progress. From an economic standpoint we certainly have a very definite task in influencing the question of health, but not necessarily from the selfish standpoint only of our own interests, although this too is a matter for which we do not have to apologize, because if the income is not reasonably sufficient your children and your grandchildren are not going to have the expert services of the highest type of medical science until the economic returns are reasonable.

All I want to say is that whenever we have an opportunity it is right that we should accept positions on the directorate or help to guide and influence these lay organizations in the question of health. So much has been said today about one instance (and it is simply one instance, the Minnesota State Public Health Association) that I am not going to say anything more about it. The way that has been developed is rather an ideal way, because the state and county boards of directors almost without exception are composed of, if not a majority, at least a large and influential number, so that here we have a direct influence and in the right direction on the question of health, and it is probably a matter that we do not appreciate enough.

President Henderson: Are there any further comments? If not, what will you do with the report?

Dr. W. C. Carroll (St. Paul): I move that it be adopted.

The motion was regularly seconded, put to a vote and carried.

President Henderson: Report of the Treasurer, Dr. Condit.

Dr. W. H. Condit read his report as Treasurer.

TREASURER'S REPORT FOR 1931

RECEIPTS

Balance on hand Dec. 31, 1930		$ 7,343.99
Dues collected, placed to checking fund	$19,747.58	
Placed to savings fund	12,330.00	32,077.58
Refund from Dr. Workman		400.00
Refund from Minn. Public Health Assn.		10.99
Interest on checking account	71.77	
Savings account	238.57	310.34
Total		$40,142.90
Total disbursements		$37,177.69

Balance on hand Dec. 31, 1931	$ 2,965.21
Outstanding checks	$ 350.50
Bank balance	$ 3,315.71

DISBURSEMENTS

Annual Meeting		$ 1,470.46
Minnesota Medicine:		
$4,000; 1930 deficit $1,493.12		5,493.12
Notes payable		2,000.00
Rent		300.00
Stenographers and clerks		2,064.91
Public Health Education Committee		3,186.52
Consultation Bureau		225.00
Treasurer's office:		
Salary $100.00, expense $1.57		101.57
Education Committee:		
Paid to Dr. Johnson	$10,800.00	
Paid to Dr. Workman	2,000.00	
Paid to Dr. Sogge	250.00	
Expenses	1,971.15	15,021.15
Secretary's traveling expenses		410,15
Secretary's salary		4,200.00
Conference of county secretaries		436.64
Interest expense		3.00
Hospital and Medical Education Comm.		14.88
State Health Relations Committee		5.07
Historical Committee		63.35
Council		267.77
Conferences		664.46
Miscellaneous Items:		
Office furniture, fixtures & expense	214.75	
Unbudgeted committees	150.26	
Postage	231.06	
Telephones	158.25	
Printing Matter	106.37	
Telegrams	13.22	
Minor miscellaneous	376.13	1,250.04
Total expenditures		$37,177.69

Of the above balance on hand Dec. 31, 1931, of $2,965.21, there must be deducted the sum of $915.00 representing 1932 dues, leaving $2,050.21.

STATEMENT OF THE SAVINGS FUND

Balance on hand Dec. 31, 1930			$ 4,984.46
Dues added to the savings fund			12,330.00
Interest on this account in 1931			238.57
Total			$17,553.03
Transferred to the checking fund	Jan. 2	$ 2,000.00	
	Apr. 1	5,000.00	
	July 1	10,553.03	
Total			$17,553.03
Balance in this fund Dec. 31, 1931			None

STATEMENT OF THE CHECKING ACCOUNT

Balance on hand Dec. 31, 1930	$ 2,359.53
Dues added to this account	19,747.58
Interest on the checking account	71.77
Transferred from savings account	17,553.03
Refund from Dr. Workman	400.00
Minnesota Public Health Association	10.99
Total	$40,142.90
Total Disbursements	$37,177.69
Balance on hand Dec. 31, 1931	$ 2,965.21
Outstanding checks	$ 350.50
Bank Balance	$ 3,315.71

TREASURER'S REPORT

Period—December 31, 1931, to May 1, 1932

RECEIPTS

Balance on hand Dec. 31, 1931		$ 2,965.21	
Dues collected:			
Deposited to checking fund	$17,167.00		
Interest on checking fund	22.49	$17,189.49	
Total in checking fund			$20,154.70
Deposited to savings fund	$11,375.00		
Interest on savings fund	75.60		
Total in savings fund			$11,450.60
Total receipts			$31,605.30

DISBURSEMENTS

Annual Meeting		$ 314.81	
Conferences		145.25	
Consultation Bureau		75.00	
Council		167.07	
Educational Fund		1,500.60	
Historical Committee		137.40	
Hospital and medicine		-------	
Legal		-------	
Minnesota Medicine		2,000.00	
Public Health Education Committee		1,383.89	
Rent		100.00	
Secretary's Conference		528.31	
Secretary's salary		1,400.00	
Secretary's traveling expense		183.08	
State Health Relations		-------	
Stenographers and clerks		1,247.45	
Treasurer's salary and expense		1.50	
Miscellaneous items:			
Furniture and fixtures	$ 5.00		
Office supplies	50.25		
Postage	115.31		
Printed matter	91.19		
Telephone	87.15		
Telegraph	4.01		
Miscellaneous	177.45		
Unbudgeted committees	153.69	684.05	
Bruce Publishing Company:			
Deficit for year 1931	1,726.26		
Payment 102 members over 2,000	204.00	1,930.26	
Refunds overpayment of dues:			
Upper Miss. Val. Med. Soc.	37.00		
Wright Co. Med. Soc.	1.00		
Park Region Dist. and Co. Med. Soc.	3.00		
S. W. Minn. Med. Soc.	1.00	42.00	
Total disbursements			$11,840.67
Balance on hand			$19,764.63

President Henderson: Dr. Collins, will you comment on the report?

Dr. Collins: There is only one comment the Reference Committee has to make, and Dr. Locken will make it.

Dr. O. E. Locken (Crookston): In analyzing the report of the Treasurer the Reference Committee felt that there should be some additional information. You will notice that the entire savings account has been withdrawn and placed in the checking account. We want you to understand what that means. When a large amount of money is gotten in at the first of the year, as much of that as possible is put into a savings account to draw interest. As it is needed it is transferred back to the checking account so that it is used as indicated here. We thought possibly you would get the idea that the Association has used up all its money when it transferred its entire savings account, but this Association has what is called a fiscal agency fund which is really the reserve fund, and that today amounts to $24,679.26. That is the permanent reserve fund.

There is another item that the Reference Committee wanted to bring out. You will notice from the report that there was a deficit of $1,726.26 for Minnesota Medicine. The Publishing Committee have taken steps this year to meet that situation, so they have changed some of the expenditures and the report to the Council last night was that up to date, this year, 1932, there was a balance surplus of about $800, so that Minnesota Medicine is now making money rather than losing it as they did last year.

The Reference Committee wanted those two facts presented to you.

President Henderson: Dr. Savage, might we have the report of the Fiscal Agency, just a synopsis?

Dr. F. J. Savage (St. Paul): This report shows the carrying value of securities held by the Minneapolis Trust Company of the figure Dr. Locken gave you, $24,679.26. There has been, of course, a shrinkage in the market value of these securities as compared with the carrying value, but as compared with a good many business concerns it is not great. It amounts to about 13.7 per cent, which I think speaks rather well for the type of investments which we have.

In addition to that, since the first of the year there has been one Northern States Power bond bought, and there is cash on hand of $437.55 up to May 15, which makes the net carrying value of the trust fund practically $25,000.

President Henderson: I am sure this report of the Fiscal Agency is very interesting. I think all of you would like to have the Fiscal Agency handle your affairs.

Dr. John M. Armstrong (St. Paul): The report of the Treasurer was not sent to the delegates, and no report of this reserve fund was sent to the delegates. In the Treasurer's report which was handed us this morning it says it covers the period from December 31, 1931, to May 1, 1932. That is for four months only. I notice in the disbursements that some of the items cover twelve months. For instance, it has just been brought out that the Public Health Education Committee spent $1,383.89 in twelve months. This deficit for Minnesota Medicine of $1,726.26 covers twelve months.

It seems to me that gives a very erroneous idea of the finances of this Society, and I think the Treasurer's report should have been sent to the delegates. The report covering the period before this, before December 31, 1931, was never sent to the delegates at all, and this report covering the period from December 31, 1931, to May 1, 1932, was only handed to the delegates who came here this morning.

Secretary Meyerding: I might explain for the bookkeeper. We have had the auditors, Shannon and Byers, for years, and they approved these figures. The annual report figures correspond as well as the others.

Dr. Armstrong: I don't question the figures at all, but I think it is very badly put. Here is a thing that covers four months in part of it and twelve months in another part. It may be correct; maybe the money was spent in those amounts up until this time, but it seems to me to be a very strange report.

Secretary Meyerding: In our auditor's report the same figures exist for the twelve months.

Dr. Armstrong: I am not questioning the figures. I say it isn't the report.

Secretary Meyerding: We go by the auditors. They tell us how to run the books.

Dr. W. A. Coventry (Duluth): What item in the partial report as of May 1 covers it as of 1931?

Dr. Armstrong: The report just made by the Public Health Education Committee covers twelve months since the last meeting. It says at the top here four months.

Dr. Coventry: That doesn't appear on my report, anything about twelve months here.

Dr. Armstrong: I just put it in because it was reported as twelve months.

Dr. Coventry: Who reported it?

Dr. Armstrong: The Public Health Education Committee.

Dr. Coventry: I think Dr. Armstrong probably misunderstood somebody's report that this amount of money was spent during the year.

Dr. Armstrong: I will call your attention to the deficit for the year 1931.

Dr. Coventry: It says for the year 1931. It does not say anything about anything else.

Dr. Armstrong: Why take this here for just the four months? I don't doubt that the figures are correct. I am not saying anything about that, but I mention the fact that no report was given to the delegates until this morning.

Secretary Meyerding: These reports did not come up before then.

Dr. Armstrong: They should.

Secretary Meyerding: I agree with you. We have to pay the deficit after the first of the year. The deficit in Minnesota Medicine for 1931 was paid for in 1932. We can't pay it before it exists.

President Henderson: Is there any further discussion?

Dr. Coventry: I move that the report of the Treasurer and the report of the Fiscal Agency Committee be accepted.

The motion was regularly seconded, put to a vote and carried.

President Henderson: Report of the American Medical Association Delegate. I will call on Dr. Wright.

Dr. C. B. Wright (Minneapolis): Mr. President and Members of the House of Delegates: We have had two meetings of the House of Delegates of the American Medical Association which have not been reported on. Dr. Braasch will discuss the Philadelphia meeting, and I will say a few things about the last meeting in New Orleans.

The thing I was particularly interested in, as you know, was veterans' legislation. The Philadelphia meeting passed a resolution advocating an insurance plan of benefits for veterans. That stirred up a good deal of interest.

The Board of Trustees appointed a committee on legislative activities and Dr. West and the Chairman of that Committee were asked to appoint an auxiliary committee on veterans' legislation. We had several meetings, one in Indianapolis with representatives of the Executive Committee of the American Legion, one in Chicago at which were present representatives from the Veterans' Administration, the Board of Trustees, both committees and the American Legion.

Then we had a follow up meeting in Washington on the first of February, and then we met before, or with, first the National Rehabilitation Committee consisting of, I understand, representatives from every state in the union, and presented our resolution. They did not approve our resolution. They did not feel that it was sane, rational or sound economics, and they were quite sure that Congress would never pass it. So at the meeting before the Medical Advisory Committee of the Veterans' Administration, we dispensed with the discussion of the resolution and went on to discuss various aspects of the whole situation. Finally a Liaison committee was appointed consisting of four members of the American Hospital Association, The American Legion and the American Medical Association.

There was nothing definitely settled, but we established friendly and cordial relationship with the American Legion. Mr. Cliff of Minnesota was one of the Committee. The interesting thing about it was that although at Detroit they had passed a resolution telling us in no uncertain terms that they did not care to have any suggestions from the American Medical Association on the care of veterans, at this meeting they solicitated our coöperation in the handling of this big problem, which the leaders in the American Legion, I think, are beginning to realize is tremendous and they are not satisfied with the workings of the Veterans' Administration. They would like our support and coöperation.

The government has made enormous investments in veterans care. It has taken on something which the world has never tried before.

In New Orleans we made a report of our Committee which was received with considerable enthusiasm. There were some interesting developments. First, it was the general opinion that any definite plan should be abandoned by the American Medical Association and that we should help the states organize as there were several plans already proposed by various state associations. We felt that we should work with the American Legion and coöperate with them, and give them our best advice and try to convince them that the veteran who has an acute surgical and medical condition particularly, cannot be properly and efficiently taken care of under any system of government red tape or veterans' hospitals, that these acute medical conditions must be taken care of through the regular channels established for the rest of the people, and that further hospital building for this purpose should be abandoned.

The medical man, who I think has the most influence in the American Legion, came to the New Orleans meeting soliciting our coöperation. His plea is that: First, the Veterans' Administrations is not handling the problem the way it should; that the Veterans' Administration is controlled by a layman who dominates the medical department. He even told us that Dr. Griffith, who is the Medical Director, has to call up Colonel Ijams before he can talk to General Hines, and if the Colonel is busy he must wait to talk to him before he can talk to General Hines about medical care.

The trouble is lay control of the medical care of veterans. He feels that the care of the service connected man should be emphasized. He claims that if we show our interest and coöperation, other problems of the non-service connected disabilities will iron themselves out.

Due to the fact that "hard times came in the middle of this depression" as Andy says, the meeting in New Orleans was poorly attended, but it was an excellent meeting. I think the papers were up to standard, as usual. Dr. Thayer gave a very interesting paper on medical education, which I think every medical educator ought to read with some care, because he made some suggestions about medical education, particularly secondary education in the United States which I think was exceedingly valuable and interesting.

The particularly interesting thing, as usual, was the scientific exhibit. Year after year it gets better. I was particularly struck with the beautiful, artistic work being done by the various exhibitors. Haydn had a very interesting exhibit on anemia, from the Cleveland Clinic, and, as usual, the Mayo Clinic had probably the most beautiful exhibit at the meeting. Dr. Dewey's and Dr. Bargen's exhibits of wax models on rectal conditions, operative procedures, and so forth, were really marvelous.

As far as the House of Delegates was concerned, except for veterans legislation, I think any one who attended the House of Delegates was impressed with the interest of the delegates, and the better attendance than a few years ago. When I first attended the House of Delegates, you could find delegates all through the sectional meetings and at various other places. They would come in to help elect the president, at the last minute.

At New Orleans, some 162 members sat through the meetings in a hot room and listened to reports with apparently a great deal of interest.

The reports were discussed very thoroughly and some of the reports aroused considerable comment and stirred up quite a bit of discussion. For instance, Dr. Brook of Michigan introduced a resolution and asked for a committee to study the subject of birth control. The House of Delegates took the stand that they didn't know what birth control was. They wanted to know what was meant by birth control, birth prevention or contraception. There seemed to be a rather general feeling that papers to explain the situation would be interesting; also scientific investigations of the whole situation to find out what is going on, but for the House of Delegates to come out and endorse at the present time, until it at least reaches some more scientific plane would be inadvisable.

As far as News Orleans was concerned, of course, its hospitality is proverbial. It was a little too hot for comfort. We wound up the meeting by electing Dr. Dean Lewis President of the American Medical Association, and designating Milwaukee as the place of the next meeting. The complete walk-away of Milwaukee for this meeting rather suggested to me they still had not forgotten the thing that made Milwaukee famous.

President Henderson: We would like to hear from the other delegate, Dr. Braasch.

Dr. William F. Braasch (Rochester): I am supposed to give a résumé of the transactions at the meeting held in Philadelphia in 1931. Before doing so, I would like to touch upon some of the interesting data which appeared in the report of the Board of Trustees for the years 1930 and 1931. These reports are printed annually in the Journal of the American Medical Association, giving opportunity for all members to read it. I am under the impression that very few members of this House of Delegates here assembled have read this report carefully. I fear there are but few of us who are familiar with all the work that is going on under the direction of the officials, the committees and bureaus of the American Medical Association, all of which are supposed to be under the guidance of the Board of Trustees.

It is quite remarkable how many ramifications there are in the field of economic medicine which are being carried on for the benefit of the physicians of the country. It is unfortunate that so few of them are familiar with all that is going on. I am sure if they were, they would feel they were getting a great deal for the nominal sum being paid for dues to the American Medical Association.

I wish there was some method whereby the most important features of the work could be headlined in some way and brought home to the casual reader. It would certainly be a wonderful thing for the American Medical Association and I believe it could be done. We have the monthly bulletin, it is true, which has made a great advance in carrying home the activities carried on, and making us familiar with the work, but at the same time it is more or less in a casual and routine way. I think it would be worth while if some of the more important features of the work carried on by the Association were featured at intervals in the Journal of the American Medical Association.

It is superfluous for me to say that the Journal today stands unquestionably as the outstanding medical journal in the world, and is so recognized by all observers.

Among the other publications supervised by the genial editor of the Journal, who is with us today, particular mention should be given to Hygeia. The continuous progress made by this journal should be a source of tremendous satisfaction to us all. It has undoubtedly been of great help to medicine. This publication is certainly to be congratulated on the fact that it is being read by such a wide circle of laymen. We should further its circulation in every way possible. I know the Women's Auxiliary has done much in this respect, and we medical men should do more to see that it is read by our patients.

I don't know how many of you are interested in the Quarterly Cumulative Index Medicus, but when anybody writes a paper the first thing he does is to turn to the Cumulative Index Medicus for his references. As you know, the Carnegie Foundation has helped to publish the Index Medicus in the past. However, they have given up their support and have placed the onus of its publication upon the officials of the American Medical Association, who have taken it up, and will continue the publication which is so essential to scientific medicine. Certainly, in assuming this responsibility, the Association is fulfilling a great benefaction upon the future of scientific medicine.

The Coöperative Medical Advertising Bureau is another item that perhaps might have escaped your notice, which I think is very important as a development in medical journalism. We are informed that there are but thirty-one state journals represented in this bureau. There is no adequate reason why every journal sponsored by a state medical association should not be included in this list. The work of this bureau is unquestionably of aid in raising the character of many medical journals. In some cases it makes the publication of state journals possible, and incidentally it serves to eliminate unethical journals in this field. That alone is an industry or activity which is well worth while and should be acknowledged.

Let us not forget the American Medical Directory which is published every other year. I dare say many of you have found this to be an invaluable aid. While there are some features open to criticism, on the whole it is certainly a very valuable publication. There is at present a movement on foot to definitely standardize the various medical specialties. It is being proposed that before anyone can practice a specialty he must pass an examination given by some recognized national society in the specialty. If a list of those so recognized could be published in the directory at some future date, it might be of great value to us.

The Library.—Your committee would especially recommend the continued development of the package library service which was increased during the year some 20 per cent. This has been of tremendous help, particularly to those who live away from the centers and don't have access to the large medical libraries that we have, for instance, in the Twin Cities. It has increased in the past year some twenty per cent, which shows its importance and how much it has been appreciated. It makes available a wide range of material ordinarily unobtainable in outlying districts. This, together with the correspondence regarding references, is a most important service of the Association.

I can't speak too highly of the work of the Council on Pharmacy and Chemistry. This most important council is increasing from year to year and is a tremendous factor for the advancement of modern medicine. Together with its subsidiary, the chemical laboratory, they are doing a most important piece of work in establishing the high standard of therapy set by our Association. We would especially commend the Journal for its action in giving full publicity to the investigations of this council.

I don't know whether you fully appreciate the importance of the Committee on Foods. The work has just been started in the last year or two, and it has been given an independent status lately because of its importance. While it may be too early to pass judgment as to the final value of this work, nevertheless it would seem that what they have already accomplished is of a distinctly constructive nature. If it can influence and correct any untruthful statements made in advertising foods, it will be of great value to the public. If it can be of help in giving the profession a better idea of the value of certain nutritional facts, it will also be worth while. There have been some criticisms made of the methods employed, but I think the faults have been corrected in the past year.

The Bureau of Health and Public Instruction is also doing good work in its efforts to stimulate the interest of the laity in medical problems, and this should be furthered in every legitimate way. The influence of the radio seems to be increasing apace. Those of us who are forced to listen to the so-called health messages given out by Dr. Brinkley and men of this type naturally resent their blatant audacity. We understand that efforts have been made by the Association to overcome this, and it apparently is a very difficult problem to solve.

The Bureau of Legal Medicine and Legislation, handled by Dr. Woodward, has been of great value, as you all know, keeping us in touch with legislative progress, and also helping us solve the various legislative problems.

The Bureau of Economics was established at the Philadelphia meeting by the House of Delegates. Work has been done along that line previously, it is true, but it had not been carried on in an organized manner. During the past year a creditable amount of work has been done. Those of you who have read the report of this year have probably been surprised at the wide scope of subjects outlined for the future activities of the bureau. A point has been made, however, that future activities of the bureau might be concentrated so as to find a solution of a few of the most urgent problems confronting the medical profession. We could well afford to make an increase of expenditure in attempting to find the solution of many of the problems which are of most vital importance to us.

On the matter of income and expenditure, according to the auditor's report the American Medical Association is adding to its surplus gradually by wise methods, and this has now reached a very considerable figure. Comment was made in the last meeting of the House of Delegates that we might use some of the surplus money in the treasury to further certain activities essential to the progress of organized medicine. In other words, while future accumulations should be safeguarded in every way, we could use the surplus money for some of the purposes I have mentioned.

You will pardon me for going into detail on these various questions, but I am sure they are of greatest importance to all of you who are interested in organized medicine.

President Henderson: These are very important questions. We only wish we had more time to take them up and discuss them. We would like to hear from Dr. Johnson.

Dr. H. M. Johnson (Dawson): Mr. President and members of the House of Delegates: Reports on these various meetings have been given very completely, and there isn't much to add to them. However, I want to say this: that the American Medical Association is a wonderfully big giant of an organization. There is power there. It is hard to comprehend until they use the direct methods necessary to protect our profession. I think the Legion, for one thing, is not the last one to realize that when the American Medical Association really takes hold of things and means business there is a time that they had better listen and consult with them, rather than be against them.

As far as the work of the American Medical Association is concerned, it is very extensive in many ways, and is wonderful. I think in one way we might say it has entered somewhat of a new era. Before it has been mostly scientific. Now it is beginning to be a little more economic, and probably more directly active in legislative affairs. You have a wonderful Bureau of Legal Medicine and Dr. Woodward is one of the finest men you can ever find, but he needs help. There is no man who doesn't need help in these days. I think this committee has been a wonderful asset for his bureau.

I want to say to you that the Legislative Committee of the American Medical Association has done wonderful work in contacting the Legion and are going along on right principles. At first, the Legion wouldn't talk to the American Medical Association. Now they do talk to them and talk nicely. They want to talk to them again. I think it is a fine thing that the two organizations are getting together.

The American Medical Association is also tackling the economic problem and are backing up the Legion's legislation. That started in Philadelphia. In this last session the A. M. A. was more forward looking along that line than ever before, and I feel great progress has been made. It isn't just one state. It has to be all states, and we all have to work under one head, which is the great American Medical Association. I think we have every reason to be proud of it.

President Henderson: Dr. Stewart, are there any more credentials to be presented?

Dr. A. B. Stewart (Owatonna): Before making a supplementary report, may I ask if any delegates here have not handed in their credentials.

There have been tihrty-five credentials handed in. The Secretary has vouched for two, and I think there are three more in the audience, which will make forty delegates present.

President Henderson: The next order of business is the report of the Editorial Association Committee. Is Doctor Larsen here?

Dr. O. O. Larsen (Detroit Lakes): Dr. Watson is chairman of this Editorial Association Comimttee. In his absence he asked me to report. I shall read his report first. However, I wish to state we have had two meetings this year.

Dr. Larsen read the report submitted by Dr. J. A. Watson.

REPORT OF COMMITTEE TO COÖPERATE WITH THE MINNESOTA EDITORIAL ASSOCIATION

It becomes more evident as time goes on that this committee has a useful function to perform. Throughout the year we have been in close touch with the Minnesota Editorial Association through the committee of that association, which has been appointed to confer with the State Medical Society.

Progress has been made in the direction of clearing away many of the misunderstandings which have in the past existed between the two professions and a foundation has been laid for work that will undoubtedly be beneficial to both. Mr. Benshoof, chairman of the editorial committee, has been exceedingly active in endeavoring to outline a plan whereby some form of concerted advertising, which would not be objectionabel from the standpoint of medical ethics, might be undertaken with a view to the benefit not only of publishers and doctors alike, but more specially the benefit of the public at large. There is certainly nothing in the code of ethics which forbids such advertising, though it is true that the ideas of the doctors and of the editors do not yet entirely coincide on this matter.

Your chairman has had many conferences with Mr. Benshoof and the members of both committees and has attended nearly all of the meetings of the chairmen of the various committees of the State Medical Association and also the county secretaries meeting.

J. A. Watson, *Chairman*.

Dr. O. O. Larsen: This is the report I have seen fit to give with the help of Mr. Benshoof.

Dr. Larsen read his report.

REPORT OF EDITORIAL ASSOCIATION COMMITTEE

During the past year your Committee on the Joint Advisory Board of Public Relations with the Minnesota Editorial Association has maintained contact and had a conference with the Press group on January 22, 1932.

At this conference the suggestions as made by the Press group were unanimously adopted and they were asked to prepare and present in some specific form concrete examples of the form of ethical advertising or publicity in which they felt the medical profession might engage for the dissemination of authenticated scientific facts regarding the treatment of physical ills, and thus assist in making the great mass of newspaper readers medically-minded in favor of the legitimate practitioner rather than the quack and imposter.

Mr. Roy L. Dunlap, managing editor of the St. Paul Pioneer Press-Dispatch, a member of the Press group, is here to present these sample layouts and to explain in detail his viewpoint of how organized medicine will be benefited, directly and indirectly.

Your committee is of the opinion that there is a decided change in the viewpoint of many members of our organizations relative to the proposal of having a somewhat closer contact with the Press than has been the case in past years. Such a contact will, we are convinced, be beneficial to both Medicine and the Press in the better understanding which will result and the possibilities of mutual gain for both organizations as a whole.

As a matter of fact, various groups of organized medicine have, during the past two years, engaged in a campaign of paid advertising in the newspapers with excellent results. This is shown by a national survey now under way by a committee of the Illinois Medical Society, headed by Dr. J. H. Hutton, past president of the Chicago Medical Society. Another survey is being undertaken by the Julius Rosenwald Fund, of Chicago and New York.

On February 25, 1932, a conference was held at Chicago by the committee working in Illinois and representatives of the daily newspapers of that city—the first conference of its kind ever held in either the city or the state. This followed a similar conference with representatives of the large advertising agencies in the same city.

At that conference it was suggested that the following problems might be included as among the things which members of the medical profession desired to convey to "the man on the street": (1) People ignore physical danger signals; (2) The doctor is frequently called in too late; (3) People are delaying calling the doctor because of economic depression, and are not aware of the medical treatment available to them at little cost in the average community; (4) The public needs to be educated on the subject of regular health examinations by the family physicians; (5) The public needs to be educated to avoid self-medication; (6) The public needs to be given some enlightenment in the matter of economics and the idea that the doctor is the last person to be paid; (7) Advertising, coupled with news story and lectures, would become a powerful factor in eliminating the medicinal impostor, quack and charlatan.

In New York, the Committee on Health Examination, in the name of the organized medical profession of Greater New York, conducted an extensive campaign in 1931, established the fact that valid, ethical, paid advertising could be carried on without in any way relaxing the constraint imposed upon the individual physician. The campaign was pronounced universally successful, brought additional patronage directly to the doctors within the area covered, and the cost was very moderate. The effects of the campaign will be noticeable for a long period in the future.

The Winnebago Medical Society, of Rockford, Illinois, conducted an immunization campaign, using chiefly paid newspaper space, and attained outstanding results. Similar campaigns are reported from (not necessarily covering immunization, but of a more general character) the states of Iowa, California, Washington, New Jersey, North Carolina, Ohio, Kansas, Texas, Wisconsin and West Virginia. Results from these varied according to the attention given them, text matter used, period of time covered, amount of money expended, etc.

Several of these states used a series of articles prepared and sold by a Wisconsin publicity expert, but it was agreed that these were too general in type to be applicable in many localities, and this could and should be overcome through a direct contact with newspaper publishers familiar with the conditions to be met in any given area to be covered.

The observations of Mr. Ernest Elmo Calkins, dean of the advertising world, located at Detroit, Michigan, may be worthy of quotation here:

> The advertising that doctors do must be unselfish, devoted entirely to the value and importance of health and the means of preserving it, and especially the necessity of having a family doctor to consult with, and his importance in the scheme of things.

The Committee of the Illinois Medical Society, in summarizing their research survey, has this to say:

> The final important consideration to be set down here is that it has been proven advertising can be conducted for the medical profession on a strictly ethical plane and with successful results where it employs proper advertising technic.

Minnesota has the distinction of being the first state in the Union to establish a direct and permanent contact with organized medicine and organized newspapers, and it is quite likely that this movement and method will be adopted in other states.

Your committee has found this contact both pleasant and profitable and recomemnd further conferences which cannot but be otherwise than mutually beneficial —and profitable.

We also recommend that the most serious consideration be given the proposals of the Press representative appearing before you with his sample layouts explaining how paid advertising may be used by organized medicine in an ethical, dignified and profitable manner.

O. O. Larsen, M.D.

President Henderson: The Reference Committee, Dr. Collins.

Dr. A. N. Collins (Duluth): The report of the Editorial Association Committee is very interesting indeed. The report of the Editorial Association Committee as made by its chairman, who was absent, and by Dr. Larsen, who has just reported to you, outlines the work of the committee during the past year. It recommends that serious consideration be given to the proposition of the press representative who will appear before you with his sample layouts to demonstrate how advertising may be used in an ethical, dignified and profitable manner.

President Henderson: We have pleasure in having with us today Mr. Roy Dunlap, managing editor of the St. Paul Dispatch, who has agreed to talk to us for fifteen minutes. We will be very pleased to hear from you, sir.

Mr. Roy Dunlap: Mr. Chairman and gentlemen of the House of Delegates: I am not going to take the fifteen minutes because I know you are busy and what I have to say can be said very briefly.

A great many of you are familiar, of course, with what the Editorial Association Committee, of which I have the honor to be a member, and your Medical Committee have been doing in the past year and a half to work out the problem of a better contact presenting the side of medicine in a legitimate, authoritative way.

It is not necessary to tell you that the newspaper is second to none in its zeal to safeguard the public. Our prime function, of course, is to give information. When we get that information we want to be able to swear that the information about medical subjects is true; we cannot hope to do that without the coöperation of the members of the medical society.

I believe the doctors and the newspaper men are very poor business men, and rightfuly so. The doctor has his scientific mind which he must develop and follow, and he hasn't time to pay attention to some of the sordid details of the commercial world. The same is true of the editorial department of the paper which I happen to represent. We are taken up with giving facts and figures, data to the public in the shape of authentic news, as authentic as possible, so we haven't time. We leave it to our business managers, because it is a proposition of revenue.

What I am trying to explain is this: I am not here to make a selling talk for any advertising program. I couldn't do it if I wanted to. I know nothing about it, but I do know that the public is being preyed upon from a great many sources which you and I can stop if we will only get together.

In the last few years there has grown up a method of public information dissemination which is in its swaddling clothes, and which has not yet learned its lesson of responsibility to the public. I speak of the radio broadcast. It makes me very tired to sit at home with the radio on in the evening and hear some of the most terrible information broadcast in the name of science and medicine. It made my blood boil one night to hear a station broadcast from Mexico on the treatment of spinal meningitis in South Dakota. We propose to meet with you gentlemen in a campaign to stop that sort of thing.

This campaign was designed on two lines: (1) To educate the public to pay the doctor; the doctor is worthy of his hire; (2) to educate the public to call the doctor. I have brought with me some sample layouts because pictures speak louder than words.

(Picture) I am going to leave this in Dr. Meyerding's care as long as I have explained them briefly to you.

Here is one along the line of calling the doctor.

Here is a man who says, "I guess it is the mumps."

Here is one discussing anemia. These are put up merely as samples to tell you what the two committees have been working on.

Those two dealt with the question of health. Here is one that deals with the doctor's job. Here is a picture of a man standing in front of the doctor's office in a thoughtful mood, and the question is, "What about the next time?"

I am not going to read all of these, gentlemen. I am not going to take up the time. I am going to leave them in Dr. Meyerding's good care, and I am sure they will be here for your inspection or in the exhibit hall.

There are just one or two things I want to emphasize in this program. First, I want to thank the doctors who represented your committee. They worked well under the tutelage of Dr. Watson. We have had frequent meetings and they have been excellent meetings. There has been a minimum of dispute and we have worked in a real coöperative spirit that gave us courage to go on and present this program. I want to thank you also at this time for the privilege of appearing before you to tell you briefly what we have done.

I want to emphasize that this program must be done in a cohesive manner. It must be done with the coöperation of the medical men. If this program is adopted and these advertisements appear in newspapers, we want to know that the subject matter has been O. K.'d by the physicians themselves, or any committee they suggest before they see the light of day. That will attest to their authenticity.

The second is that I would like to suggest that program if adopted, be presented in a group of state newspapers, and not in one little section, county, or district. That may be done later. After the state campaign has been made, they can be carried down to the smallest home through the medium of the local newspapers. That could be done by the district or the county.

This is not going to cost anybody a great deal of money. I think it should be put on through assessments, perhaps, and I am sure you will find the rate will be very low because we are willing to go our share of the way to help you present this case.

There has been an attempt made in some sections of the state, I believe, to rather anticipate a campaign by running a local series of advertisements. All very well and good. We welcome that as evidence of earnestness in the soundness of our position, but I believe the best benefits are going to be had if this is done by your body as a whole and by our group as a whole. That is the feature which I would like to leave with you, that this should be done by the State Association in a selected list of newspapers, and if it is going to be carried on in localities it will be done after it has appeared in a statewide or large way.

I do not need to tell you of the value of advertising, how the citrus growers, for instance, put themselves on the map. I do not want you to expect, if this series of advertising is run, that you are going to see results tomorrow, the next day, or next week. You probably will not see them for months to come, for the history of advertising teaches that the results are not going to come the instant of exposure. It is like the constant dripping of water on a stone, the constant wearing away, which will bring about education of the public.

The newspaper which does not perform its function of educating the public is not a newspaper in the true sense of the word. We cannot hope to present medical education without your assistance. We in St. Paul have been very fortunate. This question was thrashed out some years ago, and the Ramsey County Medical Society appointed a committee to work with the newspapers, with the result that when anything new bobs up in the way of a supposed cure, we immediately refer it to the doctor's committee, and are able to print it with a note of caution from the doctors that this thing is rather new, and we had better wait until it is further developed and further experiments have been made before we accept it. We all know that the man who is ill and in desperate straits, is a drowning man grasping at a straw when a new cure appears.

I am going to leave these advertisements with you. I want you to study them. I want you to know they are done in the most dignified manner. There is nothing there that is going to in any way cross the doctor's code of ethics. There is nothing in there that you would be ashamed to have appear in your local newspapers, because the whole idea is educating along two lines: Guard your health, call the doctor when you are ill, and pay the doctor, and I am sure if this campaign is run in that way, in due time you will see it will have a wonderful result.

Gentlemen, I thank you.

President Henderson: We will arrange to have these posters in the State Association booth downstairs so if any of you wish to look them over you can do so at your leisure.

We have with us this morning our genial Dr. Fishbein, and we would very much like to hear from him, if he could give us some information.

Dr. Morris Fishbein: Since the subject of advertising by the medical profession has been introduced, I might just as well talk a few minutes on that subject, since I will have an article on the subject in the next issue of the bulletin of the American Medical Association. I discussed the subject before the New England Medical Council in Boston about two months ago, and I discussed the same subject at the meeting of the Chicago Medical Society on economics about three weeks ago.

There is a whole lot more to advertising than just buying some space in a newspaper and developing an educational message. I may first of all agree absolutely with the editor of the St. Paul Dispatch that it is the duty of the newspaper to educate the public on health just as much as it is its duty to educate the public on bridge, etiquette, cooking, and various similar topics. I noticed evidence in the Pioneer Press this morning of some attempt to educate the public on the subject of health, unfortunately educating them entirely wrongly, and by a man who is wrong about ninety per cent of the time, namely, Dr. William Brady.

In the Pioneer Press Dr. Brady tells the public that the ambulatory treatment of hernia by injection is the proper method, and he also says that the right way to remove tonsils is by electric coagulation. I presume your message will appear on the opposite side of Dr. Brady's article, so the public may take its choice. He is being paid for it by the paper, and the paper is paid for by the buyers. That is an unfortunate situation, but it occurs not only in the Pioneer Press but in other newspapers. There are men writing health education sentiments in newspapers that are not sound, and newspapers have learned always to buy material on the quality of the writing and on the perhaps sensational manner of the exposition rather than on the basis of scientific accuracy.

As to buying space in newspapers, that is not entirely a new idea. In 1927 a state association, through the individual county societies, spent approximately $75,000 raised by special assessments in order to buy space in newspapers. If I had my lantern slides here I would throw them on the screen and you would see the same ads that have just been shown to you, practically the same type of advertisement that has been shown to you today. I may say that the advertisements and the entire campaign were not only without success, but really had an unfavorable reaction on the medical profession, because every time the medical societies bought a quarter of a page, the chiropractors bought two pages and the osteopaths bought a page or two. Each day after the medical advertisement there would appear a competitive ad by the chiropractors and osteopaths. The medical society tired of the drain after six months, and the advertising campaign was discontinued, representing not only a total loss but worse than a total loss. They had to overcome prejudice that was raised by entering into controversy with men who could not be considered their scientific equals in any way.

It is the duty of newspapers to educate the public on health, but people who best know how to write material on health are physicians, and the authoritative group of physicians is the state medical association.

In the state of Indiana the state medical association issues material to newspapers on health, and the newspapers not only run it without charge, but feature it on their editorial pages. In Wisconsin the same thing is done. In Michigan the same thing is done. In addition to that, we all know space is being bought today to educate the public on health in magazines, and may eventually come to newspapers, by the great manufacturing houses that coöperate with scientific medicine, and which depend on the good will of scientific medicine for their support.

The Metropolitan Life Insurance Company spends four million dollars a year in health education, and I may say it is sound health education carried out under Dr. Armstrong. Practically all of that material is sound. The Parke-Davis Company spends $250,000 a year for purely educational copy which is run in the Saturday Evening Post, Ladies' Home Journal, Literary Digest and Time. Squibb and Company spends approximately $200,000 and Eastman Kodak Company approximately $1,000,000 a year on health education along this line. You have all seen these advertisements.

You have heard Logan on the radio Sunday night, and the great series put out by Squibb over the radio. Money is being spent in sums so great that anything you might put before the public would be merely a drop in the bucket. There would also be the added possibility of having your motives misunderstood, and of having opposition groups, the cultists and quacks, entering into competition with you.

In Rockford, Illinois, where I spoke, the doctors of the community advertise in the newspapers not only as a society but individually. Many of the doctors of the community, possibly forty of them, put their cards in the newspaper every day, with their names, office address, hours, telephone number, and specialty, if any. They got into a great deal of difficulty. The osteopaths, chiropractors, naturopaths, and physico-mechanics of various types began inserting ads which were intermingled with those of the doctors in alphabetical order. They said to the newspaper, "You induced us to enter this educational campaign. What is the idea of mixing us in with the charlatans?"

"You said you were out for education of the public."

So there were two tables, one headed "Physicians," and the other table headed, "Other physicians." So here are the doctors on this side, physicians, and on the other side of the page, other physicians.

Quite recently the Hudson County Medical Society bought themselves a page in the newspaper in Passaic, New Jersey, and in surrounding newspapers. They took an entire page to print the names and addresses of all the doctors in the county medical society, and then they had put in every physician's office a certificate hung on the wall indicating he was a member of the county medical society. That ad ran once and, as far as I know, nothing has come of it, and probably nothing ever will.

The classified telephone directory tells the public the same thing. If they want to know where a doctor is, they look in the classified directory. They may be mixed up with osteopaths and chiropractors, but if people have any luck they may get a good doctor. If they get a good one, they will keep him, and if they get a bad one, they will discontinue going to him. Advertising of physicians is impossible because it places a premium on the man who can spend the most money, and he is usually the charlatan because he gets his practice through money and not through his scientific accomplishments.

Collective advertising by a state medical society to educate the public in health is unwarranted because it is the duty of the schools of the United States, first of all, to educate the public in health, and they are doing that in increasing measure through coöperation with a committee of the American Medical Association and the National Education Committee. Health is now placed first among all subjects to be taught in elementary and high schools in the United States, and children today are learning about their bodies, and learning what a good physician is. If you will look at the textbooks of biology and physiology in the schools, they are learning how to tell the difference between a quack and a good doctor. That is the place to begin educating about health, in the grade schools and then in the high schools, and not in the newspapers.

The next point about educational health is that newspapers must educate the public regarding health if they are going to be good newspapers. The gentleman who preceded me has told you that when a new medical discovery is made the newspaper has to put it on the front page or it isn't news. They have to say, "Liver extract is found to be valuable in the treatment of pernicious anemia." That is what the people want to know. We needn't worry about the newspapers paying attention to news in the field of scientific medicine.

On the question of educating people to pay their doctor, it is quite conceivable that they can be educated to pay their doctor. I feel that the dignity of medicine and the science of medicine is such that we are in a bad position by going out and buying space to educate the public to pay for service which, if they get good service, they are glad to pay for. Doctors have their percentage of uncollectible bills, which is probably larger than for other services. Department stores don't have it because they stop credit.

If the doctors will study their own economic situation, will study methods of collection, methods of extending credit, and methods of handling their own work in a serious, scientific and business-like manner, extending credit to those who require it, taking care of the poor and those unable to pay, really putting their profession on a scientific, business-like basis, they will find they can reduce their losses and increase their ability to collect just the same as any other business.

I don't know how much money you people have to spend on this kind of ads or whether you want to assess your individual membership to buy them. I hope you will all read the article which will come out in the bulletin of the American Medical Association, which constitutes a survey of this entire experience over a period of five or ten years. I hope you will study the matter much further and give it real scientific study before you adopt it, rather than being swayed by the impulse of the moment, which is that in a time of depression we try everything possible in the hope that business will improve. Then when business does improve in the ordinary course of events, you are likely to say "It was the last measure that brought it about," just exactly as you say that it was the last drug that went down the patient's throat that brought about the cure, which may have come about in the natural course of the disease.

President Henderson: Thank you, Dr. Fishbein. Is there any further discussion?

Dr. C. B. Wright (Minneapolis): I agree with much that Dr. Fishbein says, but I don't believe he intended to give the impression that local societies should take no interest in this subject.

It is true that certain societies have locally put on campaigns which they think have done some good. We know that doctors in the smaller towns buy space in the newspaper. Perhaps they could use the money spent to better advantage.

I would like Dr. Locken to tell us about the publicity campaign in his society.

Dr. O. E. Locken (Crookston): It would take a great deal of courage for any man to stand up here and offer an opinion contrary to the brilliant mind of Dr. Fishbein.

We people went into this matter this spring, and it was a question of whether we should do something positive about the economic situation. We are not attempting to advertise to the people on the science of medicine, but we are trying to do something in regard to changing their opinion about paying the doctor.

For the first ten years, most of us are very flattered in having patients come to us, and some of us thought for a long time that these patients were coming to us because of our own brilliance. After we had about $100,000 on our books, we began to think possibly they came to us because it was pretty good service that cost them very little.

So we are beginning to change our attitude just a little. We are now running a series of advertisements in the paper of Crookston that is paid by the two clinic groups in that town. We are advancing some information in regard to present medicine. The first advertisement, for instance, stated that the doctor is not only giving you his time and his judgment, but he is giving you something that costs money when he gives you an examination, because he is using scientific instruments that cost a good deal of money, and for that reason he has to expect that you pay for that service. The advertisement which came out last week said, "You should add a sixth item to your budget." To the necessity of budgeting groceries, taxes, and so on down the list of fundamentals, that they should add something to their budget for medical attention.

The first advertisement that came out did state that these two organizations were sponsoring this advertisement in order to protect the rest of the doctors in the community who do not want to spend any money for it. We had this matter before the local organization in the town. We presented it to the Red River Valley Medical Society. They could see no objection to it, and said it helped others as well as themselves.

We had very interesting reactions. I had a woman say, "You didn't send me a bill. I called you out at three o'clock in the morning. I know you people are entitled to your money." We have had men write in and say, "I have noticed your advertising, which is O.K. with me," and send in their check. People in our community are getting to feel, when you have given your service, "How much will the charge be?" They go into the business angle more than they have in the past.

It is done in a purely dignified manner. I find when I am through talking to people I don't feel I have to apologize when I ask them to go into the business office and hand them the bill. I used to. I felt as a dignified physician I should only talk to them on scientific matters. I found that when my own psychology changed it was easier to talk to the people about that. I feel sincerely that there is a better relation between my patients and myself now than there was a year ago when I hardly dared mention the subject of money to them. We have a finer relationship between the patient and the doctor.

Out in the country we are getting to have the reaction that the specialists in the city have. When the people come in they expect to pay, and have a very high respect for our services.

We have only been running this a short time. This is purely a sample effort over a period of three months. There is just another side of it which I think ought to be mentioned. Every week a lot of information has been sent out by the Minnesota State Medical Association to all the newspapers in the state and our editor has thrown every one of those in the waste basket every week for the last three or four years. We have talked to him about it. He said, "Why should I be interested in your organization when you are not interested in mine?" We feel we can go to him (he is a good friend of ours), because we have spent a little money with him and expect him to put in this legitimate information which the state medical society is sending out, and he will. I know he will because the bankers of that territory said they would buy no more printing material from him if he continued to publish on the front page every time a bank closed in that territory. For two years there has never been an item in the Crookston paper that any bank had closed. These men understand economics, and we propose to talk to them in the language they can understand.

Dr. Morris Fishbein: I would like to say that of course I have been quite misunderstood by Dr. Wright and Dr. Locken. I did not say it was unethical to advertise. It has already been established that it is quite ethical to buy advertising space, and any county or medical society can make its own decision. There are many communities in which individual physicians can advertise. That is considered ethical. There is no question about the ethics of the situation at all. This is merely a matter of business and psychology.

You have to decide whether or not it pays you to carry advertisements to have patients pay their bills because once you start to carry the advertisements you are going to have to carry them on and on and on, as they say, into the night, because here is an editor who doesn't print anything about medicine, who doesn't print the releases of the state medical society unless he gets an ad. He doesn't print anything about banks failing now because the bankers have brought a little pressure to bear on him. Once you get yourself into the situation where the knife is at your throat, the knife remains at your throat.

There are many good newspapers in the United States that constantly carry all the items sent to them by the state medical societies in those particular states, in Indiana, Wisconsin, Michigan, and a great many of the papers in Illinois. They are glad to print the material because it is well written, educational material, and if they had to buy it from the society they would buy it from the society. They do in Toledo, Ohio. In Toledo the newspaper buys the releases from the Toledo Academy of Medicine and pays for them, because they want that kind of material.

Advertising should not be indulged in extensively unless it pays, and it has to pay in proportion. You have to find out whether the cost of what you put into the ad is coming back in increased collections, or in a changing point of view. Then you have to measure what is already being done, and avoid duplicate coverage. When the Metropolitan Life, Squibb, Eastman, and others are spending six or eight million dollars a year in this type of advertising, you have to count where your $20,000 or $25,000 is going. Or you may be able to take $200,000 out of your membership, I don't know; I doubt it. But I imagine you might be able to do that for an advertising campaign. It will take a great deal. I am not sure you are going to spend your money for advertising and get it back in this particular way, but my survey of what has been done before causes me to doubt it extremely.

Dr. C. B. Wright (Minneapolis): I would like to ask Dr. Fishbein what he thinks of a plan for publicity through savings banks on saving for sickness.

Another thing: I would like to ask Dr. Locken specifically what this service is costing them in Crookston.

Dr. O. E. Locken (Crookston): We are paying for what they call quarter page advertising. I don't know how many square inches that is, but we are paying $175 for twelve of them. There are nine doctors paying for this, and it costs us less than $2 a week apiece. We collect one bill.

I see Dr. Norman is here. He is another man helping to pay for this, and I think has as much of a positive opinion as I have.

Dr. Morris Fishbein: Answering the question specifically, I very much favor the idea of educating the public to save for sickness as they do for death, to get them to realize that sickness is inevitable and that they must save for sickness as they now save for an anticipated death.

In Worcester, Massachusetts, the plan has been put on in a big way, a local bank coöperating. In this case the bank buys the advertising, not the medical profession. The bank buys the advertising because the banker feels it is a good selling point for savings accounts in his particular bank. They have not only bought advertising space in the newspapers but have developed a direct-by-mail campaign to the individual residents of the community, and sent pamphlets direct by mail. Of course that is another point.

When you come to consider the question of education through advertising, you must remember that there is not only advertising in newspapers but advertising on the radio, direct-by-mail, advertising through pamphlets given directly to your patients by yourselves when they come in, which is the quickest and most direct way of reaching your patients that you want to reach. If the patients don't pay you, it is possible to develop literature that you can hand them, or send to their homes, that will tell them more than you can in the newspaper.

Bear in mind, I have not said you should not go into this scheme. I have not said Dr. Locken's scheme is not perfect for his town. I merely said that, so far as I know, no state has ever yet been successful with the kind of campaign proposed here as a state-wide measure. That is the experience thus far. In Minnesota it might work, because all sorts of things happen in Minnesota.

Dr. J. F. Norman (Crookston): Mr. President and Gentlemen: Dr. Locken undoubtedly has stirred up something here as well as in Crookston because, as he intimated at the beginning of his talk, we were not all in favor of his scheme to begin with. I think we all had the feeling it was rather unethical and undignified to go ahead advertising in any manner.

However, this series of ads has been run, and it is rather early yet to express our reaction toward it, but as Dr. Locken said, I think it is going to be favorable. People have been educated through many health agencies to believe they should get service for nothing. They will come in and have a rather elaborate examination, and you tell them there is really nothing needed in the line of medical treatment but you give them advice. They will ask you if there is any charge for the examination, because they have not received a prescription. We are hoping to educate them away from the feeling that the doctor need not be paid for his services, but are trying to have them understand that we expect to be paid for our work. That might not be dignified, but I believe the reaction in Crookston and in the Red River Valley will be favorable.

President Henderson: Mr. Dunlap, would you like to add anything?

Mr. Dunlap: I would like to suggest that inasmuch as Dr. Fishbein has a rival column with Dr. Brady, that would make him an incompetent witness.

We have merely tried, gentlemen, to offer something in the way of coöperation to beat back the racketeer and the charlatan in this thing. He is getting a foothold; there is no question about it. The doctors come to the newspapers and say, "You are putting in this sort of tripe in the way of medical advertisements. Throw it out of your paper."

The editor says, "I will throw it out. What will you give me in its place?" They shrug their shoulders and say, "That is your business and not ours." The editor is expected to give up that revenue. We all know we can't be in business for our health in this day and age. As I say, we didn't have any idea of precipitating a riot or a large sized controversy. It has been very interesting and I have enjoyed it very much. Thank you.

President Henderson: You have all heard the report of the Editorial Association Committee. Is there any motion to adopt?

Dr. W. A. Coventry (Duluth): I move the report be adopted.

Dr. H. M. Workman (Tracy): I second the motion.

The motion was put to vote and carried.

President Henderson: Report of the Committee on State Health Relations.

Dr. T. H. Sweetser (Minneapolis): I do not like to read this whole report; there were just two subjects that were taken up, principally, during the year, in which I think you would be interested. One of them is medical care of the poor, and the other is the medical care of veterans.

The subject of medical care of the poor was rather revived by a letter from Dr. Adams of Bird Island, and Dr. Meyerding helped us arrange a symposium on the subject at the Secretaries' Conference in January. It was a very interesting symposium with talks by men from different states, and a final talk by Attorney General Benson on the legal aspects. I would like to mention the discussions by Dr. Scofield and by Dr. Herman Johnson. The experiences in Lac Qui Parle County seem to have been very successful; there is a definite arrangement there between the County Commissioners and the doctors. Recently Kandiyohi-Swift County Society appointed a committee with Dr. Branton of Willmar as chairman. They raised some questions as to conflicts between the extracts from the law that we published in Minnesota Medicine and the opinion of the Assistant Attorney General. I have spent considerable time at the Attorney General's office since that, and I think that there is no conflict unless in the understanding of the terminology of the law. At our meeting last night we decided to have copies of the different contracts and agreements between doctors and county commissioners in different counties in Minnesota sent out to the members of our committee through the state, and then an opinion, if we can get one, from the Attorney General as to the legality of these different agreements so that when questions are raised, you can get some direct information from the members of the committee in your own districts.

A minor matter has come up recently, and that is with regard to having medical representatives on the county child welfare boards, and we are going to get in touch with the Board of Control and the different child welfare boards and see if this can be done, or whether it is advisable.

We have discussed the care of veterans rather extensively, and have drawn up a resolution which we have sent to the Reference Committee. In our report we said that we are in favor of the principle of taking care of emergency medical and surgical non-service-connected disabilities of veterans in their community hospitals by their home physicians, and that we recommend that the State Medical Association declare itself willing to coöperate with the Legion in any such plan that may be adopted. We also stated in our report that we think that, as a medical society, we had better confine our advice to the medical aspects of the question, and leave the economic questions to other associations outside of medicine. I want to say that we are very much obliged to Dr. Wright, Dr. Meyerding and Dr. Johnson for their coöperation and advice, based on their knowledge of what has gone on in the American Medical Association.

In different counties, especially in Ramsey County and Hennepin County, the committees on veterans' legislation have been very active. Since we sent out a letter from our committee we have had replies from all over the state saying that they have passed the proposed resolutions regarding shifting the care of emergency cases to the home communities instead of sending those patients to veterans' hospitals. We have had different discussions with leaders of the Legion. Mr. Cliff, who is their national committeeman, and Mr. Sjoselius, chairman of the rehabilitation committee, say that they are willing to coöperate in so far as emergency cases are concerned. I think you know the rest of the arguments on the affair from your printing in Minnesota Medicine. I want to emphasize that the economic side of the problem is under discussion all over the county, and I think you have seen in the newspapers that opinions vary very widely. People in New York have come out against care of any non-service connected disabilities, and I think President Hoover recommended to Congress that they limit expenditures to service-connected disabilities. However, we have a large number of veterans' hospitals which cannot be scrapped without a good deal of loss. I think the subject is still open for discussion, and we should be willing to discuss the matter with the Legion in Minnesota to help find the fairest solution. I think we should limit our actual recommendations to advice on the medical aspects of the problem.

REPORT OF COMMITTEE ON STATE HEALTH RELATIONS

During the past six months two problems principally have occupied the attention of the Committee on State Health Relations: the medical care of the poor, and the medical care of veterans.

MEDICAL CARE OF THE POOR

This problem has become more and more important since the onset of our present financial depression. Two years ago, in at least one county in this state, there was a working agreement between the doctors and the county commissioners. Early last year the subject was brought up through a case in Duluth, and a legal opinion was furnished the State Medical Association by Mr. Brist. We also had explained to us, the methods of contract used by various Iowa County Medical Societies. Later in the year further difficulties were presented, and in the January number of Minnesota Medicine we published extracts from the statutes and Minnesota Supreme Court rulings covering several vital points. At the Secretaries' Conference on January 23, 1932, we held a symposium on the subject, hearing the experiences of men from Iowa, Wisconsin, Illinois and Minnesota, including our own attorney general. The attorney general, Hon. Henry Benson, expressed his interest in our problem, and offered any assistance he may be able to give in settling any problems of law that may arise in regard to care of the poor. Within the last week a letter was referred to me which indicated that some confusion exists regarding parts of the problem. The Committee on State Health Relations is glad to help find the answers to any questions raised.

MEDICAL CARE OF VETERANS

This problem has had more and more attention from physicians during recent months. At present the ideas about it are so varied that it is hard to say what the outcome will be. We feel that the ordinary non-service-connected disabilities of veterans and especially acute and emergency disabilities should be cared for in their own communities by doctors of their own choice. Leaders in the American Legion in Minnesota feel that emergency disabilities of veterans should be treated in their home communities, but wish to see that much in successful operation before committing themselves further. Your committee has taken an active part in discussions of the medical aspects of the problem.

Your committee has declared itself in favor of the principle of the care of acute (emergency) medical and surgical non-service-connected disabilities of veterans in their community hospitals and by the home physicians of their own choice, and recommends that the Minnesota State Medical Association declare itself as willing to coöperate with the Legion in carrying out the details of such a plan.

No statement was made as to whether or not the medical care of non-service-connected disabilities of veterans should be at federal expense; it has been suggested that such a statement would hardly be within the sphere of a medical organization. However, it seemed to us that there should be no trouble in agreeing that at least all emergency non-service-connected disabilities would be more safely and more promptly treated in the veteran's home community than at a distant veterans' hospital. The whole problem of veterans' care is still under discussion and it seems to us that no further declaration is needed at this time.

T. H. Sweester, M.D.

Vice President Adams took the chair.

Dr. Collins: The report of the Committee on State Health Relations was considered and the Reference Committee endorses the sentiment regarding the care of acute emergency medical and surgical non-service connected disabilities of veterans in their home communities.

The State Medical Association wishes to go on record as willing to coöperate with the Legion in carrying out the details of such a plan.

Vice President Adams: Dr. Wright, you were asked to discuss this report.

Dr. C. B. Wright: I didn't think there was anything to discuss about this report. I am thoroughly in sympathy with their action, and I would commend it to the House of Delegates for endorsement.

Vice President Adams: Is there anything further?

Dr. W. A. Coventry (Duluth): I move the report be accepted.

Dr. H. M. Workman (Tracy): I second the motion.

The motion was put to a vote and carried.

Vice President Adams: Next is the report of the Heart Committee.

REPORT OF HEART COMMITTEE

It is with pleasure that I inform you of the fact that the organization of the Heart Committee is now complete and ready to function. We have, in the past year, increased our contacts by having fourteen men thoroughly qualified to speak on Cardiac Subjects approved by and added to the Extension Division of the University. The names of these men may be had on request.

We have also established contact with the Radio Committee and it is our plan to have a certain number of these hours on the Radio given over to discussions of cardiac subjects for the instruction of the lay public.

The success of the Heart Committee, however, depends upon the demands that are made upon it, and the greater the number of demands, the more good will the members of the State Society get from the Heart Committee.

We are now ready to supply qualified speakers that are willing and ready to go to any of the county societies' meetings to give talks on cardiac subjects as desired by these respective county societies.

During the last year, I am sorry to say that we had only one such request, which came from a group of men in the vicinity of Worthington and Fulda. At the request of Dr. Slater for Cardiac speakers, Dr. Fredrick Willius and Dr. Harry Oerting presented an evening's program which I understand was very excellent and well received.

It is the wish of the Heart Committee that many more such societies will request speakers. There is an excellent choice of men available, which should take care of the needs of any of the societies.

Where possible, it is the desire of the Heart Committee that the men located the nearest geographically to the county society requesting a speaker be used, especially in view of the fact that these men are all serving without recompense. For example, for a society located closer to Duluth than to the Twin Cities and with such excellent men available as we have in Duluth, the Heart Committee would suggest using these men rather than sending some from Rochester or the Twin Cities, and in the same way, in the southern part of the state, it would be better for us to send men from Rochester than from the northern part of the state. The Heart Committee would just appreciate this degree of coöperation.

May I assure you and also the various county societies that we can guarantee to put on a good show with the talent that we have available.

The following speakers are available for talks on heart subjects to medical societies and public health groups under the auspices of the heart committee:

Dr. H. E. Richardson, St. Paul
Dr. E. T. Herrmann, St. Paul
Dr. Harry Oerting, St. Paul
Dr. C. N. Hensel, St. Paul
Dr. Max Hoffman, St. Paul
Dr. A. R. Barnes, Rochester
Dr. F. A. Willius, Rochester
Dr. F. J. Hirschboeck, Duluth
Dr. E. L. Tuohy, Duluth
Dr. Olga Hanson, Minneapolis
Dr. Reuben Johnson, Minneapolis
Dr. Morris Nathanson, Minneapolis
Dr. Moses Barron, Minneapolis
Dr. Marx White, Minneapolis

Most cordially yours,
Harold E. Richardson.

Dr. H. E. Richardson (St. Paul): You all have the report so I won't read it to you. Since this report went out, the committee has established contact with the Critchfield committee on Public Health Education. Now I feel our organization is complete. It functions through the central Heart Committee. Through Dr. Critchfield's committee, any requests for speakers for public health education, either of the profession or the lay public, will be handled through the Heart Committee.

Second, is the contact with the Radio Committee. The Heart Committee will sponsor talks to be given to the lay public over the radio on cardiac subjects.

Third, which I think is the most important, we have established contact through Dr. Thomas' committee by having a list of speakers on cardiac subjects approved by the Extension Division of the University, so that any requests for speakers on heart subjects coming into that division will be referred back and handled by the Heart Committee. So I feel now we have a central organization that should cover this subject throughout the state.

I feel we have a very excellent and representative group of men fairly distributed throughout the state.

I am now going to make request that the Minnesota State Medical Association send out a notice to the chairman of each program committee of the respective societies and ask that they devote one program in the year to cardiac subjects, for which we will be very glad to furnish the speakers. We ask that the request be made directly to the Heart Committee, and that they pick out from this list, which will be mailed to them, the men they choose with the subjects that they wish covered at that meeting. I think in this way we will get the coöperation of the various county societies and the facts and truths and latest things that have come up in cardiac work can be disseminated to the full society.

President Henderson resumed the chair.

Dr. Collins: The Reference Committee in considering this report combined its recommendations with that of the latter part of the Hospitals and Medical Education Committee. The suggestion is made that in addition to the work of the Committee, a series of short courses be outlined at central points, such as the university, to be given two or three times a year for physicians who desire to avail themselves of this educational feature. The speakers might be selected in the same way as they have been in the past.

This is especially aimed at the Heart Committee report inasmuch as the work may be hampered by lack of material for demonstrations in outlying communities.

This suggestion was thrown in for the possibility of exciting some discussion on it.

Dr. Richardson: We had exactly that point in mind in establishing a relation with the university.

President Henderson: May I have a motion that the report be accepted?

Dr. E. S. Boleyn (Stillwater): I move it be accepted.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: We will take up a few rather short reports here and hurry along. Report of the Editing and Publishing Committee.

REPORT OF THE EDITING AND PUBLISHING COMMITTEE

It is with regret that we have to report a deficit in the publication of Minnesota Medicine for the calendar year 1931, of $1,726.26.

This deficit occurred despite the fact that there was a shrinkage in cash income as compared to the year 1930, of only $568.67, and resulted principally because of the enlarged size of the journal and the greater number of illustrations used during the year. During 1931 there were printed 1,460 pages or an average of 121.6 pages per issue. This exceeds by 170 pages any previous volume. The number of pages printed during the year 1930 averaged 107.5 pages per month. This, compared with 1931, showed an increase per month of more than 14 pages an issue.

There were printed last year 1,092 pages of reading material and 368 advertising pages. The reading pages included 138 scientific papers and 24 case reports. Had all this material been supplied to the members of the Association in book form, it would have made a volume of 1,460 pages, with 318 halftone illustrations. There was an average of 26.5 halftone illustrations for each monthly issue during the year.

Effective January 1 the Editing and Publishing Committee decided to standardize on a 100-page journal monthly. Other economies have also been effected. If this standard of 100 pages is adhered to throughout the year, which it undoubtedly will be, it is almost certain that the publication of the journal for 1932 will show a surplus. For the first quarter of the present year our report shows a net suplus of $494.70. The May number contains the largest volume of local advertising that any issue of the journal has ever carried, and plans are under way by which it is hoped to materially increase local volume of display advertising for the year. Obviously this depends to some extent upon general business conditions but, regardless of the very unfavorable conditions in all lines of business, we feel safe in promising that there will be no deficit for the present year.

All kinds of publications have experienced tremendous losses in advertising volume during the past two years, and no relief of any consequence is anticipated for 1932. This volume loss is chargeable mainly to national business, all of which is handled through the Coöperative Medical Advertising Bureau, an auxiliary of the American Medical Association. Minnesota Medicine volume for 1932, in this class of advertising, compares more than favorably with other state journals. This is due in no small degree to the high standing and fine reputation which the journal has throughout the country. But, as before stated, the Editing and Publishing Committee has reduced the size of the journal for 1932 and effected other economies which should be sufficient to more than provide for the anticipated loss of volume and leave a surplus for the year.

At the close of the year our records show that subscriptions were paid on 2,063 members, and that the journal was still being mailed to 135 delinquent members. There were upon our list 103 doctors paying the annual subscription of $3.00, who are not members of the State Association. There are being mailed out monthly 359 copies on the complimentary list, to exchanges, to advertisers, etc., leaving a surplus each month of approximately 140 copies. A large number of these surplus copies is used in supplying miscarried copies, as samples to advertising prospects, and to prospective non-member subscribers.

While the past two years have shown a deficit in the publication of Minnesota Medicine, it is only fair to call attention to the fact that each of the eleven preceding years shows a very satisfactory surplus over publication costs, since it was established fourteen years ago, and that the total receipts over the entire period, from all sources, substantially exceed publication costs.

Statement showing income and expense for the year is attached.

Very truly yours,

J. R. Bruce, *Business Manager.*

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS, MINNESOTA STATE MEDICAL ASSOCIATION, PUBLISHERS MINNESOTA MEDICINE

For Period January 1, 1931, through December 31, 1931

SOURCE OF CASH RECEIPTS

Display advertising		$ 9,966.84	
Illustrations		84.11	
Member subscriptions		4,126.00	
Non-member subscriptions		308.59	
Bad accounts recovered		64.86	
Gross cash receipts		$14,550.40	
Less:			
Discount and commission			
Advertising	$1,331.57		
Subscriptions	13.23		
Collection fee	16.66		
		$1,361.46	
Total net cash receipts			$13,188.94

CASH DISBURSEMENTS

Journal expense	$14,915.20
Cash deficit for period	$ 1,726.26
Accounts receivable Jan. 1, 1931	$1,024.13
Accounts receivable Jan. 1, 1932	$1,226.32

Dr. J. M. Armstrong (St. Paul): The report of the Editing and Publishing Committee was sent you some time ago, and you all have a copy of it.

We are sorry to say we had a deficit last year, and we hope we will have no deficit this year. In fact, we are ahead of the game at the present time, which will leave the disposition of this report to the Reference Committee.

Dr. Collins: I believe the Reference Committee had no recommendation excepting to recommend the acceptance of their report.

Dr. H. M. Workman (Tracy): I second the motion

The motion was put to a vote and carried.

President Henderson: Report of the Radio Committee. Is Dr. Maxeiner here?

REPORT OF THE RADIO COMMITTEE

During the past year Dr. O'Brien has continued to make his weekly talks over WCCO. He has covered a great assortment of medical subjects interesting to the public, in a manner that has cast much credit upon our State Association. The fact that his talks are timely and on subjects about which the people wish information is evidenced by the fact that he is receiving a large number of letters regarding his broadcasting, many questions are asked and requests for talks and explanations, either by mail or radio broadcasts, are made. As a result of his radio efforts, Dr. O'Brien has given more than fifty talks before lay organizations such as parent and teacher associations, women's clubs, etc., with audiences ranging from 60 to 1,200. He has also addressed numerous scientific meetings throughout the state, hospital staffs, surgical societies and a large number of nurses' association meetings. In this way, Dr. O'Brien has been spreading in a very active manner medical education. The direct contacts, Dr. O'Brien feels, are due directly or indirectly to his radio broadcasting.

During the past few months our Committee has considered the advisability of extending our broadcasts to other radio stations such as KSTP, the University, etc. We feel that undoubtedly we could obtain the cooperation of the University Medical Department who would handle their own broadcasts. KSTP at one time offered us the use of their station but have not had the funds to finance another speaker such as Dr. O'Brien nor do we know of a speaker who is not in some way in competition in private practice who would meet all of the peculiar demands of the rest of the medical profession. It is essential that such a speaker be not enagged in competitive medicine. No action has finally been taken upon this matter.

WRHM broadcasts over 1250 kilocycles which happens to be the same as that assigned by the National Radio Commission to the University of Minnesota, Carlton College and St. Olaf's College. Recently WRHM has requested the Radio Commission for full use of this wave length which means that the University, Carlton College and St. Olaf's College would, be entirely displaced from the air. Because of the character of the broadcasts from WRHM, this is of particular importance to the medical profession as they repeatedly advertise free medical examinations at Rosedale Hospital which is owned and operated by Troy Miller who, it is also reported, owns WRHM. I have communicated with the other members of my committee and have sent copies of their replies to the Secretary of the State Society. Every one of this committee not only opposes the extension of WRHM but are entirely in favor of curtailing the hours of WRHM and giving additional time to the educational institutions. At my suggestion, editorials have appeared in both Minnesota Medicine and the Journal Lancet. The matter of the request of WRHM is apparently coming before the National Broadcasting Association at an early date which, we understand, is the last hearing before that committee.

Respectfully submitted,
C. N. Hensel, M.D.
C. B. Lewis, M.D.
J. J. McGroarity, M.D.
L. H. Rutledge, M.D.
George Steven, M.D.
F. P. Strathern, M.D.
A. L. Vadheim, M.D.
S. R. Maxeiner, M.D., *Chairman.*

Dr. Collins: The Reference Committee want to commend the part that WCCO has taken in regard to educating the public. The Reference Committee goes on record urging all possible influence on the National Radio Commission in an effort to curtail the time allowed station WRHM. They suggested that the Radio Committee assist Dr. Price in any possible way.

You are all familiar with the dissemination of health matters that Brinkley broadcasts, and also what trouble the station at Muscatine gave the medical association in Iowa with regard to the tuberculin testing of cattle. We think it is the duty of every delegate and every doctor in this state to influence the Radio Commission to curtail the time of these stations that disseminate knowledge to the public the way WRHM is doing at the present time.

President Henderson: You have all heard the report.

Dr. Collins: I move the adoption of the report.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: We will now jump a little further down the list to the report of the Committee on Medical Economics. Dr. Pearce is ill, I am sorry to say, and cannot be here, but Dr. Braasch has Dr. Pearce's report. Dr. Braasch will present the matter, and Dean Scammon will talk afterwards.

Dr. W. F. Braasch (Rochester): I am sorry to have to give this report, which is entirely the work of Dr. N. O. Pearce. I happen to be one of the members of the committee, but the work is entirely that of Dr. Pearce and he has put a tremendous lot of time and endeavor into it, and the excellence of his report, I am sure, you will subscribe to. I am awfully sorry he was unable to be present here, today, on account of ill health.

Dr. Braasch read the report of the Committee on Medical Economics.

REPORT OF THE ECONOMICS COMMITTEE

This committee, authorized by the house of delegates last year, has spent a very considerable amount of time during the past year, but have limited their studies to the question of number and distribution of physicians in Minnesota, with special reference to what the future may hold in this direction.

You will recall, at a meeting a year ago, it was clearly demonstrated that there are a great many more physicians in the United States per capita than any other country in the world and that Minnesota had only 882 people per physician and seemingly a definite increase, each year, in the number of physicians, altogether out of proportion to the increase in population.

The committee has endeavored to determine, as nearly as possible, just what the present situation in Minnesota is and what we may expect in the future under present conditions and what we may be able to do to change the present unhealthy trend.

Before we had pursued our investigation very far, we concluded that we should treat this matter as a Minnesota problem and deal with it directly as a Minnesota problem as any effort directed to a country-wide recognition for adjustment of the situation, would necessarily, be very slow in producing any favorable results.

Before presenting the lantern slides we wish to take the opportunity to express our very great appreciation of the coöperation of Dean Scanlon of the Medical School and other departments of the University and the State Board of Medical Examiners in the assembling of this material.

We also wish to express our appreciation to the 135 physicians who so kindly and promptly replied to the questionnaires sent out to the physicians in the ten key counties of Minnesota.

(SLIDE NO. 1)—This slide represents the result of the study of the population and distribution of physicians, worked from the details of township reports by the United States census for 1930. As you will note in the legend all areas in the state having more than 500 people to the township, that is 36 square miles, are represented by the cross stripe. From 300 to 500 people to the township by the horizontal bar, and from 100 to 300 by the perpendicular bar, and all areas with less than 100 people to 36 square miles are left blank.

The geographical position of the doctors in the state are represented by the dots, the large dots meaning more than one physician and the small dots meaning only one physician. You will also note those areas in the northern part of the state in which we find that there are no physicians within 15 miles area, but at a glance one can see that there is no area in the state of Minnesota in which there is a population that could possibly support a physician in which there is not adequate medical service available.

(SLIDE NO. 2)—This slide presents a study similar to that in Slide No. 1, except that the distribution of physicians is here shown in relationship to assessed property valuation. The areas in cross bars have over one million dollars to the township. In horizontal bars, five hundred thousand and to one million to the township. In perpendicular bars, two hundred thousand to five hundred thousand to the township, and territory with less than two hundred thousand assessed valuation per 36 square miles is left in blank.

This study shows very clearly and convincingly that there are physicians in every part of the state which has either population or wealth enough to furnish a reasonable income and that there are a great many physicians located in areas of such small valuation that it is remarkable that they are able to exist at all.

From the foregoing two slides, one is justified in drawing conclusions that rural Minnesota is well supplied with physicians wherever the population or the wealth of the territory would indicate that it is possible for a physician to subsist.

(SLIDE NO. 3)—This slide presents a slightly different phase of the study. Ten of Minnesota's best southern counties were selected as typical of the best of Minnesota rural districts. In this territory there was a fairly even distribution of physicians, a fairly even distribution of wealth and a fairly even distribution of population. The counties containing the stars are the ones used in this study. Many factors were taken into consideration, such as population, number of physicians, retails sales, etc. In all, there were six variables involved in arriving at the index. Now, if these counties have the correct number of physicians for population, wealth, etc., then those areas in which there is no barring of any description also have about the right number of physicians.

Those areas which have a diagonal bar have too many physicians and those having a horizontal bar might have room for a few more physicians.

It is remarkable how close this index applies to most of the states; however, every one of the 135 physicians who answered the questionnaire stated that there were only enough physicians in this territory to adequately care for the population and 85 of the 135 stated that there are now more physicians in these counties than is necessary to give adequate medical care to the people.

It certainly gave us much food for thought to find what a large percentage of these physicians had a net income of less than two thousand dollars per year.

There are a number of considerations which have to be gone into when one contemplates any plan for the future physician population in the states. We must first consider the source of our increase in physicians and we must consider possible increase in population in the state and consider the possible increase in the death rate of physicians now in the state. In considering the increasing number of physicians we have to consider not only the men who are graduating from our own State University Medical School, but the possibility of an influx of physicians from other medical schools. It would do no good to decrease the number of graduates from our school unless we could, in some way, develop barriers which would keep out unnecessary numbers from other medical schools.

(SLIDE NO. 4)—This slide shows the definite line of increase in the number of medical graduates for the United States. It shows that the number of graduates is rapidly increasing over the number of physician deaths.

(SLIDE NO. 5)—This slide shows the number of graduates from Minnesota in five-year periods from 1885 until now. You will note the definite increase since 1913 or 1914.

(SLIDE NO. 6)—This slide shows the steady increase in the number of physicians in Minnesota since 1906—an average increase of 46 physicians per year. It is interesting to note, at this point, that regardless of the number of graduates from our University Medical School that the number of physicians has increased at about the same rate, showing that physicians from outside come in to make up for any shortage in the medical school class.

(SLIDE NO. 7)—This slide shows that there are about one-third of all of the students that graduate from Minnesota who leave the state for other fields.

(SLIDE NO. 8)—This slide shows the population curve of the state and would indicate that we will, within a very short time, reach our maximum population.

(SLIDE NO. 9)—This shows curve of rural population of Minnesota and would indicate that there is no expectancy of material increase in rural population.

(SLIDE NO. 10)—This shows the relation of Minnesota to the general increase of populations of the United States and certain foreign countries during the past ten years.

(SLIDE NO. 11)—This slide shows the graphic illustration of the increasing rate of physicians over population during the last fifty years.

(SLIDE NO. 12)—This indicates the increasing number of Minnesota graduates locating in Minnesota.

(SLIDE NO. 13)—This slide presents a study of the age incidents of physicians in Minnesota showing that a large majority of the physicians in Minnesota still have a good many years of practice before them. It will be noted that in 1914 the average age was 42.8 years, while 17 years later the average age is only 46.6 years. It is clear, from this study, that we have no great need of increasing the number of physicians in the state because of an expectancy of a higher death rate.

(SLIDE NO. 14)—It might be interesting, at this point, to note that the number of physicians in the states immediately west of Minnesota are greatly decreasing in number.

(SLIDE NO. 15)—A glance at this slide would indicate that the incidents of acute disease, which occupies a large part of the time of the average physician, is greatly on the decrease.

We believe that conclusive evidence has been presented, in this study, to show that there is immediate need for the medical profession of the state to take such steps as are possible and practical to reduce the annual number of incoming physicians to a point where there will be at least no further increase in the aggregate number of physicians in the state until such time as an increase in population will make it possible for such physicians to make adequate incomes.

To this end we recommend that the matters in this study be referred to the appropriate committees of the State Association, that the University Relationship Committee confer with the authorities of the University Medical School and the proper committee confer with the Boards of Licensure and such other steps be taken as seem advisable to bring about this end.

This committee also has spent some time in a study of compulsory health insurance on which Dr. Michel has a brief summary.

We believe the committee should be continued for at least one more year as there are many other subjects on Medical Economics which should be thoroughly studied.

Respectfully Submitted
William Braasch.
Joseph Michel.
N. O. Pearce, *Chairman.*

President Henderson: Dean Scammon, will you discuss this report?

Dean Scammon: I think Dr. Pearce ought to be complimented on the amount of work he has put into this study. It is true we have contributed some of the more unintelligible charts to it. And these charts make me feel, as a statistician, that I am justified in quoting another statistician, who very carefully figured out that if all statisticians were laid out cold, end to end—it would be a good thing.

What I think Dr. Pearce's report brings out most strikingly is the thing that we are running into as a general situation in this country: the decrease in rate of growth of population and the concurrent increase in the rate of people trained for special services. It is hard for us to realize how great the decrease in growth of population has been. Although the United States did increase in population about sixteen per cent in the last ten years, it grew very much like an omelet that puffed up at its two ends. Fifty per cent of the increase in population in the United States, in the last ten years, took place in two states. In the north central district, of which we are a part, the growth in population was a good deal like the present growth in France. It was a very slow growth. In other words, we have got past the pioneer stage.

In this state we grew at the rate of 7.5 per cent in the last ten years, which is a higher rate than that of most of the north central states. But we also are facing a slowing down of population. The S-shaped curve illustrates that. This is characteristic of not only the population in Minnesota, but characteristic of almost any place inhabited by the European races that you study. There have been about two hundred of these regions studied and, so far as I know, only a few of them have fallen down from this course. One of them was the home of our distinguished visitor who has left, who remarked that almost anything might happen in Minnesota, and to whom I would reply, that even the impossible can happen in Chicago.

Along with this decrease in rate of population, which started thirty years ago, in 1890, not to decrease, we have had this very large increase in men who are entering the profession of medicine.

In the country, as a whole, the number of medical students is growing over five times as fast as the population. In this state, the number of licensed physicians is increasing at present at about two and one-half times, relatively, as fast as the population. In other words, for about every four hundred new people who come into this state by birth or migration there is one physician added to the group. This is the situation you have to face. It is one which is very specific and undeniable.

This condition has been recognized in other professions, but other professions, it seems to me, do not have the acute situation that the medical profession does. After all an engineer can turn to industry, a lawyer can turn to insurance or to real estate (as he generally does), but a physician tends to remain a physician. He has been trained for that purpose and he is going to continue a physician in the great majority of instances.

Some of my friends have argued with me on this subject, claiming that the increase in the number of physicians is a good thing; for it brings about competition. They forget that all of our history indicates that increased competition in medicine beyond a certain point does not work well. You can go back into history and prove quite easily that when there was too large a number of practitioners there was neither fair remuneration for the physician nor good service for the population. Also, we must remember that when we graduate a student we recognize perfectly well that we are just starting him on his profession, that he ought to be getting better for twenty years hence, and that an increase in financial competition will not bring this about.

I have outlined to you a little of the Minnesota situation. There can be no question about it. You can check it in any fashion you wish, but you will find an enormous increase of men who are entering into practice. It does not seem to depend directly on the number of men we graduate from the Medical School, for as one of these charts shows, about one-third of our graduates leave the state, and they have left in this proportion for forty years—in hard times and in good times. It does not seem to me that, perhaps, we have a mode for control in this state that is not present in other states. Through its Medical Society, its Medical Boards. and its School working together, Minnesota was the first state to gradually get standards to the benefit of the profession and the people. These agencies moved together step by step. As they increased the requirements in the School, they increased the requirements for entrance into the state. So then we have the advantage of the Medical Society. We have had the advantage of effective examining boards, including a basic science board. And I assure you that you have a medical school that is willing to coöperate with you in any way possible in considering the nature of this rather serious problem that Dr. Pearce has brought forward.

President Henderson: Dr. Collins.

Dr. Collins: I have nothing on that report.

Dr. C. B. Wright: Mr. President, Mr. Brist has an important announcement to make.

Mr. Brist: I have just talked to Judge Seely over in Minneapolis, and he told me he filed an order dismissing the case and sustaining the action of the Basic Science Board in denying a certificate to this fellow Shenk who is head of the naturopathic society.

President Henderson: Is there any further discussion? What shall we do with the report?

Dr. F. A. Willius (Rochester): I move the report be adopted.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Next is the report of the Historical Committee, Dr. Hamilton.

Dr. A. S. Hamilton (Minneapolis): You probably recall that the Committee on Necrology has been fused with the Committee on History of Medicine, so it becomes my duty to, more or less, give a double heading. I will make it as brief as I can.

Dr. Hansen has fulfilled the office of necrologist of our society for a number of years, and she prepared what I shall present today.

Death has called a number of our fellow workers. Many of these have been referred to already in the columns of Minnesota Medicine, the Journal of the Association, and we, therefore, desire only to express sorrow at the departure of these men.

The necrologist's report is headed May 4, 1931, through May 23, 1932, and refers only to members of the Minnesota State Medical Association.

Dr. Hamilton read the report of the necrologist.

NECROLOGIST'S REPORT

May 4, 1931, through May 23, 1932

MEMBERS OF MINNESOTA STATE MEDICAL ASSOCIATION

J. W. Andrews, Mankato. Born 1849. Rush Medical College, 1877; Bellevue Hospital Medical College, 1880. Aged 83.

John Bensom Brimhall, St. Paul. Born 1862. University of Pensylvania, 1890. Died December 21, 1931. Aged 69.

Gustav Fischer, Minneapolis. Born 1860. Washington and Jefferson Medical School, Philadelphia, 1896. Died June 28, 1931. Ager 71.

Albert E. Flagstad, Minneapolis. Born 1891. University of Minnesota, 1921. Died January 26, 1932. Aged 40.

J. A. Freeborn, Fergus Falls. Born 1864. Rush Medical College, 1889. Died January 25, 1932. Aged 67.

L. A. Fritsche, New Ulm. Born 1862. University of Michigan, 1887. Died June 18, 1931. Aged 69.

John Farquahar Fulton, St. Paul. Born 1856. University of Pennsylvania, 1877. Died January 31, 1932. Ager 76.

Thorvald Holen, Minneapolis. Born 1874. Minneapolis College of Physicians and Surgeons, 1902. Died January 12, 1932. Aged 58.

Walter J. Kremer, Minneapolis. Born 1878. University of Minnesota, 1911. Died April 2, 1932. Aged 53.

Walter Waugh Murphy, Minneapolis. Born 1885. Northwestern University, 1911. Died June 1, 1931. Aged 45.

Daniel D. Murray, Duluth. Born 1859. Albany Medical College, 1881. Died November 6, 1931. Aged 72.

Henry O'Brien, St. Paul. Born 1862. University of Pennsylvania, 1888. Died September 16, 1931. Aged 69.

Jon Vincent O'Connor, St. Paul. Born 1867. University of Minnesota, 1895. Died April 5, 1932. Aged 65.

John Jackson O'Hara, Janesville. Born 1868. University at Kingston, Ontario, 1898. Died July 6, 1931. Aged 63.

Reuben Nathaniel Palmer, Lanesboro. Born 1893. University of Minnesota, 1926. Died November 3, 1931. Aged 38.

Soren P. Rees, Minneapolis. Born 1870. University of Minnesota, 1897. Died October 2, 1931. Aged 61.

Walter Henry Robilliard, Faribault. Born 1861. General Medical College, Chicago, 1884. Died November 1, 1931. Aged 70.

John D. Simpson, Minneapolis. Born 1858. Northwestern University, 1882. Died October 18, 1931. Aged 73.

Henry Longstreet Taylor, St. Paul. Born 1857. University of Cincinnati, 1882. Died January 2, 1932. Aged 74.

William Jesse Taylor, Pipestone. Born 1844. Rush Medical College. Died April 15, 1932. Aged 88.

Frederick Goodwin Watson, Worthington. Born 1871. Hamline University, 1903. Died January 11, 1932. Aged 60.

Henry L. Williams, Minneapolis. Born 1869. University of Pennsylvania, 1892. Died June 14, 1931. Aged 62.

PHYSICIANS NON-MEMBERS OF STATE ASSOCIATION AT THE TIME OF DEATH

Frederick Barret, Gilbert. Born 1875. Rush Medical College, 1897. Died November 4, 1931. Aged 56.

Silas E. Brown, St. Paul. Born 1856. N. Y. University Medical School, 1883. Died October 10, 1931. Aged 75.

Dudley C. Frise, Minneapolis. Born 1887. N. W. University, 1904. Died January 10, 1932. Aged 45.

Robert H. Harrison, St. Paul. Born 1862. Died December 13, 1931. Aged 69.

Eugene Hubbell, St. Paul. Born 1855. Hahnemann Medical College, Chicago, 1883. Died April 20, 1932. Aged 77.

James F. Kline, Anoka. Born 1862. University of Minnesota College Hom. Medicine and Surgery, 1893. Aged 70.

Albert Kumpf, Hot Springs, S. D. Born 1901. University of Minnesota, 1928. Died October 12, 1931. Aged 30.

Joseph J. McKinnon, Wadena. Born 1863. University of Minnesota, 1893. Died July 31, 1931. Aged 68.

Frederick J. Mitchell, St. Paul. Born 1879. Northwestern Medical School, 1909. Died October 8, 1931. Aged 52.

Lincoln E. Penny, St. Paul. Born 1860. Rush Medical College, 1885. Died March 28, 1932. Aged 72.

Frank Lee Puffer, Bird Island. Born 1853. New York Medical College, 1877. Died May, 1931. Aged 78.

H. J. Rowe, Minneapolis. Born 1848. Died November 20, 1931. Aged 83.

Stephen O. Watkins, Bloomington. Born 1851. N. Y. Medical College, 1880. Died April 11, 1932. Aged 81.

Hugh Spaulding Willson, LaJolla, California. Born 1877. University of Minnesota, 1904. Died 1931. Aged 55.

Dr. Hamilton: Our second addition refers strictly to historical matters.

Dr. Hamilton read the report of the Historical Committee.

REPORT OF THE HISTORICAL COMMITTEE

Your Historical Committee desires to report as follows for May, 1932. The Committee has been in operation since 1927 and has each year reported its method of procedure and its progress and we are assuming it is unnecessary to again go over these matters.

At the present time, we have collected a large amount of manuscript, a considerable portion of which is ready for publication. We now plan to include in our first volume a history of the State Medical Association and a history of certain other very early medical organizations, including those along the Minnesota River Valley, the Mississippi River Valley, the St. Croix Valley and Duluth. This will include the following counties: Winona County, Wabasha County, Olmsted County, Goodhue County, Dakota County, Ramsey County, Hennepin County, Washington and Chisago Counties to include Stillwater, Marine, Taylors Falls and St. Croix Falls; the north shore group to include St. Louis, Lake and Cook Counties; Stearns County; the Minnesota River Valley group to include Scott County, Carver County, Nicollet County, Brown County and Blue Earth County; Steele County, including Owatonna, and Freeborn County including Albert Lea. To this will be added a manuscript prepared by Dr. Fairchild, dealing with the conditions under which the pioneer physician operated.

Our greatest difficulty to date has consisted in the inequality of the preparations made by different organizations and naturally we cannot well neglect the record of one area which chronologically belongs with another area, perhaps ready for publication. Up to date, Dr. Workman has had charge of the specially heavy work of the county medical societies and has collected a large amount of material which varies all the way from the most meager statement of facts or nothing at all concerning certain counties to records which are reasonably complete and even in typewritten form. Dr. Klaveness' history of Wright County is already in print.

We feel that we have availed ourselves of about everything that is possible from those members of the society who are old enough to have a firsthand recollection of interesting occurrences, but there still remains considerable to be done in the way of a search for names and dates and lists of officials, and about the only way that these can be gotten is through a search of the early newspapers which are on file in the State Historical Society, but it is hardly to be expected that members of the society from distant points should come to St. Paul for this search.

Throughout its work, the Committee has avoided as far as possible paying out the Association's money and such money as has been expended has been almost wholly for typing of manuscript and for photostats, but we feel that the time has arrived when someone must be employed to conduct a search in the library of the State Historical Society for the purpose referred to. Up to date, in only one instance has any money been allotted to pay for search for original data. In that instance, seventy-five dollars was allowed in 1929 for an exhaustive search into medical legislation in Minnesota. Through some of the graduate students at the department of history of the University or from other sources, we can have this work in the Minnesota State Historical Society library done at very reasonable rates and we ask that the Society authorize us to undertake this expenditure.

So far as is possible, we shall have the history of each county or district medical society prepared directly by or under the auspices of the official representative of that society. Where no one can be found to prepare the necessary material, the Committee will act on its own responsibility.

Our expenditures for 1930 were $43.98, for 1931 were $43.50 and for the past twelve months have been $137.40. We ask that the State Medical Association appropriate $150.00 in addition to our unexpended balance for last year of $362.60.

Respectfully submitted,
A. S. Hamilton, *Chairman.*

Dr. Collins: There is nothing in the report of the Reference Committee that has not been brought up by Dr. Hamilton in his report.

In recommending the report of the Historical Committee, we especially commend the large volume of work accomplished by this committee, and recommend the increase of their appropriation as requested in their report if it is found to be necessary.

We recommend that the delegates take the matter of coöperation with this committee up before their local societies with the recommendation that they aid in every way possible. We recommend that a committee be appointed in each local society to obtain the information desired, subject to the endorsement of the Historical Committee.

President Henderson: You have heard the recommendation, gentlemen.

Dr. F. A. Willius (Rochester): I move it be adopted.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: The next report is that of the Committee on Hospitals and Medical Education, Dr. Gilbert J. Thomas.

The report was presented.

Dr. Collins: The report of the Committee on Hospitals and Medical Education outlines the courses held in Mankato, Winona, Hibbing, Olivia, Fulda, Fergus Falls, and Marshall. In reviewing this report the Reference Committee feels that considerable work has been done. The feeling in reading the report is that interest seems to be lagging in this phase of the work. The suggestion is made that in addition to the work of the committee, a series of short courses be outlined at central points, such as the university, to be given two or three times a year for physicians who desire to avail themselves of this educational feature. The speakers might be selected in the same way as they have been in the past.

I repeated there what we had in regard to the Heart Committee report.

President Henderson: You have heard the report, gentlemen.

Dr. F. A. Willius (Rochester): I move its adoption.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Report of the Committee on Public Policy and Legislation.

Dr. H. M. Johnson (Dawson): Mr. President and Members of the House: We haven't so much to report on yet, but we have some things that are starting, and we have already done something.

At the last meeting of the secretaries it developed and was thoroughly brought out that the Shoulders' resolution would not be acceptable to the people of the medical profession of Minnesota.

As time went on and reactions came in, it was found as far as Minnesota was concerned, that something had to be arranged to see what could be done to substitute for that resolution. Accordingly, since there were other matters of importance, it was thought wise that I should go down to Washington with the legislative committee of the American Medical Association.

The passing of resolutions and letting them go to sleep hasn't occurred in this state for a number of years. It has worked out that when something is passed, something has happened.

One time we thought that by passing resolutions in the House of Delegates, wanting such-and-such a law, that would give us the law. We found, very sadly, through experience that we had to go about it in a practical way in order to get what we wanted. When we learned to do things in a practical way, we got results.

I went along down to Washington and helped out the best I could, but I want to tell you right now that if some of the members of this committee hadn't known something about legislation they would not have gotten anywhere. At one time it looked as though it was the intention to put a wet blanket on the whole meeting.

While there it also developed that the Minnesota plan—as Dr. Fishbein said, you can't tell what will happen in Minnesota—was the one that seemed acceptable to the veterans. It is a wonderful piece of work the committee has done. It means millions and millions of dollars. In one way, they are through, as the building of hospitals which were contemplated to provide 128,000 more hospital beds has been stopped and the greatest advance in state medicine that has ever been attempted by any nation any place in the world has been stopped. Therefore, the results already obtained and the contacts made are so important they are hard to realize. The committee could not continue to push the Shoulders' resolution further as no other of the groups would consider it. They did organize a liaison committee which will continue to work and study the proper method of caring for veterans. Another thing that was essential was to get in touch with our Congressmen. We had contact with them. We had them all together one night, and we put this proposition that had been worked out before them. They were heartily in accord with it. I told them they had let tariff legislation and veterans' legislation go entirely too far and it was high time to sit down quietly and think it over and see what they could do to retrieve some of the harm they had already done. They agreed fully. They thought that the plan the A. M. A. and Legion is working out together was all right. That wasn't all. The veterans' administration promised the American Hospital Association the right to investigate the cost per day for a veteran in their hospitals. This is important. There isn't that coöperative spirit you think there is on the part of the veterans' administration.

In regard to the state campaign: I don't care to what party you belong, or who you are interested in, but work for somebdy and make us of your rights as a citizen. Nobody respects a man who sits on a fence and is afraid of his shadow. You have a right to be for anybody you want to be for, but be for them and don't be dead.

There is a man I make no apologies for speaking a good word for, and that is Oscar Swenson, who is a candidate for the railroad and warehouse commission. He was the leader in our bills on the statute of limitations in the basic science fight, and has been with us 100 per cent all the time. I hope you will remember not only to vote for him, but to work for him because he is entitled to it. He is an outstanding man, a man with outstanding ability and well qualified for that position, which is one of the most important positions in the state. Therefore, I hope you will not take the opportunity to return the good and kind acts he has done for us by doing something for him.

President Henderson: We will have to speed along if we are going to get through today. We will now hear the report of the Committee of Medico-Legal Affairs. Is Dr. Hengstler here? (Absent.) Dr. Collins, can you make a few remarks on that?

REPORT OF COMMITTEE ON MEDICO-LEGAL AFFAIRS

The Committee on Medico-Legal Affairs has held no definite meetings during the past year, except that the Chairman of this Committee has been present at the meetings of the officers and Committee Chairmen, which have been held at the call of the President.

One matter of reference, only, has been submitted to this Committee, during the past year, which was correspondence from the American Medical Association relative to the formation of a Criminologic Institute in the state of Minnesota. This file was given due consideration by the Committee, and it was unanimously voted by the Committee to recommend it favorably to the Council of the State Association, and the Secretary was so informed by letter under date of September 21, 1931.

There is one matter which the Committee desires at this time to present, for consideration, to the House of Delegates. It is believed advisable that the present law, permitting the Superintendents of State Hospitals for the Insane to discharge criminally insane individuals at their own discretion, be changed. This recently received some publicity when a murderer was discharged by one of our State Hospital Superintendents, after having been committed as criminally insane by District Court, causing considerable comment by members of the Judiciary in this state. The undersigned Chairman of the Committee on Medico-Legal Affairs has been in conference with Judge Hugo Hanft, senior judge in Ramsey County, regarding this situation. Judge Hanft has expressed himself as believing that the law should be changed so as to place the matter of discharge of such patients from State Institutions in the hands of the committing Court, instead of in the Hospital Superintendent. He believes that the Court should be empowered to appoint a commission of phychiatrists to examine the patient and ascertain the advisability for his discharge, this Commission reporting directly to the Court itself. The Association of Judges in the state of Minnesota is to give this matter consideration at their annual meeting in July, 1932, and it is highly probable that necessary steps will be initiated to attempt a change in this law at the next session of the Legislature. It is the feeling and belief of the undersigned Chairman of the Committee on Medico-Legal Affairs that the Minnesota State Medical Association should go on record as recommending this change in the law, and that a copy of this proceeding be sent to Judge Hanft, Senior Jurist in Ramsey County, for him to present at the meeting of Judges in July. It has not been possible for the Chairman of the Committee on Medico-Legal Affairs to take this matter up officially with his Committee, due to the fact that the Committee is widely scattered, and it is rather a difficult matter to handle through the mail. The Chairman, however, believes that he may speak for his Committee, in requesting the House of Delegates to recommend this change in law, and present, officially, their recommendation to the Senior Jurist in Ramsey County, Judge Hanft.

No other specific matters have come to this Committee during the past year. Further study is being made of the medical expert testimony in the State, with an idea of securing, ultimately, some constructive legislation, as mentioned in two previous annual reports of this Committee. This matter has also been discussed with Judge Hanft, who concurs heartily in the opinion of the Committee that such legislation would be desirable.

Respectfully submitted,
W. H. Hengstler, *Chairman.*

Dr. Collins: I think I had better read part of the report because some of our comments may need some background.

"One matter of reference, only, has been submitted to this committee during the past year, which was correspondence from the American Medical Association relative to the formation of a Criminologic Institute in the state of Minnesota. This file was given due consideration by the committee, and it was unanimously voted by the committee to recommend it favorably to the Council of the State Association, and the Secretary was so informed by letter under date of September 21, 1931."

Then you have all the rest of this report in printed form.

The next paragraph refers to the matter of discharging insane patients from insane institutions at the sole instigation of the superintendent, and the recommendation for the correction thereof.

The Reference Committee makes the following comments: "The report of the Committee on Medico-Legal Affairs was considered, and the suggestion concerning a Criminologic Institute for the state of Minnesota was discussed. This committee is at a loss to know just what a Criminologic Institute is, and feels that the Committee on Medico-Legal Affairs should explain to the House of Delegates the function of this institution. Further, it would be a great education to the House of Delegates if the committee would give us some idea of what mechanism we have in the state of Minnesota for the prevention and detection of crime.

"The recommendation in regard to the discharge of the insane patient from state hospitals is commendable.

"The recommendation of the Committee on Medico-Legal Affairs is concurred in regarding the employment of a commission of psychiatrists to examine the patient and ascertain his ability to be discharged, said commission reporting directly to the court itself, or to other proper authorities."

President Henderson: You have heard the report, gentlemen.

Dr. F. A. Willius (Rochester): I move its adoption.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Report of the Committee on Schools for Laboratory Technicians.

REPORT OF THE COMMITTEE ON SCHOOLS FOR LABORATORY TECHNICIANS

The Committee on Schools for Laboratory Technicians has had presented to it a number of problems concerning the present situation of commercial and non-commercial schools and of the attitude of the members of the medical profession toward these schools and toward the technicians. Certain bad practices exist and in an attempt to correct these, the following steps are recommended.

Your committee has approved the enclosed three resolutions which have been prepared by Dr. Kano Ikeda. The committee urges the House of Delegates to pass these resolutions and thus enable it to give the recognition of the State Medical Association to those Schools of Laboratory and X-ray Technicians which fulfill the requirements as stated in the resolutions.

Your committee has formulated a plan for the dissemination of information to the members of the Minnesota State Medical Association with regard to technicians. This embodies the publication of a number of articles by Dr. Charles R. Drake in Minnesota Medicine, which would discuss (1) the necessity for discouraging prospective students of laboratory and X-ray technic because of the overcrowding of this field; (2) the importance of hiring only those technicians who are graduates of recognized and non-commercial schools of laboratory and X-ray technic; (3) the vital importance of referring laboratory and X-ray work only to ethical laboratories supervised by competent medical directors or to ethical physicians who are specialists in these fields; (4) the discouragement of the practice of many physicians who require their technicians to make diagnosis and to give treatments.

Your committee is convinced that the passage of these resolutions and the publication of these articles will do much to improve the present situation in the field of laboratory and X-ray technic. It will also permit the committee to answer authoritatively the numerous letters which are being received from prospective students of laboratory technic.

Leo G. Rigler, M.D., *Chairman.*

RESOLUTIONS

Whereas, A school or a course of training for medical technicians (both clinical laboratory and X-ray technicians) may be defined as an institution established or maintained for the purpose of instructing men and women to become technical workers in a clinical pathological or radiological laboratory, by offering courses of studies, together with necessary hours of laboratory practice which are essential in the proper training of such workers; under the direction of a qualified medical man, preferably a clinical pathologist or a radiologist, with the aid of qualified instructors and with teaching material sufficient to carry out the program of proper instruction and operated under the code of ethics which governs the conduct of all reputable medical institutions;

Whereas, The present day commercial schools for medical technicians, without exception, do not meet the above definition in all of its essentials;

Whereas, There are incidents to indicate that a large number of ill-informed or ignorant young women are being solicited to enroll in these schools, by misrepresentation through agents, letters or advertisements, and as a result hundreds of improperly trained technicians are being turned out of these schools annually;

Whereas, It is highly doubtful if these commercial schools for technicians will ever succeed as educational institutions, therefore

Resolved, that the Minnesota State Medical Association condemns the practices and policies of these schools and withholds any approval of them until such time as they shall come within the definition herein stated.

Be it further resolved, That this body herein records its disapproval of the identification of any member of the Minnesota State Medical Association with such a commercial school in any capacity which may give aid to the school in any manner whatsoever, as detrimental to the maintenance of high ethical standard of the medical profession.

Kano Ikeda, M.D.

Whereas, There is a distinct demand for well trained medical technicians, and, as a result, an increasing number of young women are seeking properly conducted training in Medical Technology, and whereas the courses in Medical Technology offered at the University of Minnesota are found inadequate to accommodate but a small portion of these applicants,

Resolved, That the Committee on Schools for Laboratory Technicians of the Minnesota State Medical Association recognizes the clinical laboratories (including the X-ray department) of a general hospital of not less than 100 beds, under the direction of a qualified medical director, which meets the minimum requirements for recognition by the American Society of Clinical Pathologists (and the Radiological Society of North America) as the proper and logical place to train and instruct, a limited number at a time, of future medical technicians.

Kano Ikeda, M.D.

Whereas, The American Society of Clinical Pathologists has endeavored, through registration and approval, to recognize the schools and the courses of training for medical technicians conducted by recognized hospital laboratories under a qualified medical director and,

Whereas, There are schools and hospital laboratories in the State of Minnesota which have the approval of the said Society through registration or recognition,

Resolved, That the Committee on Schools for Laboratory Technicians of the Minnesota State Medical Society proposes, for the present, at least, to recognize only those institutions which enjoy the approval of the American Society of Clinical Pathologists through registration or recognition and withhold its recognition from all others, pending such registration and approval.

Kano Ikeda, M.D.

Whereas, Both the Radiological Society of North America and the American Society of Clinical Pathologists, through their respective subsidiary agencies, namely, the American Registry of Radiological Technicians and the Board of Registry of Technicians, are endeavoring to raise and maintain the minimum standards of educational and technical qualifications of technicians in their respective fields, through certification and registration, and

Whereas, The American Medical Association, the American College of Surgeons, the American Hospital Association and other responsible national medical organizations have given their unqualified support to this program of certification and registration by the aforementioned Societies, therefore.

Resolved, That the Minnesota State Medical Association, through its Committee on Schools for Laboratory Technicians, extends its hearty coöperation to these Societies in their efforts to elevate the standards of qualifications of medical technicians by recommending to its constituent members and County and District Societies that they urge the clinical laboratory and X-ray technicians under their influence, to identify themselves with the national registry through registration.

Kano Ikeda, M.D.

Dr. C. R. Drake (Minneapolis): I feel this is rather an important report from several standpoints. Dr. Rigler, Dr. O'Brien, Dr. Schulze, and others have been working rather strenuously the past year along this line.

As you know, there are a number of commercial schools for technicians in Minneapolis and St. Paul. We have been especially pleased with these. In fact, throughout the United States we are pleased with them, and through very high class advertising, not the kind spoken of a little while ago, a great many people have been inveigled into taking these courses.

I feel it is the duty and the privilege of the medical profession to take this question of medical technology in their own hands and govern it, rule it, and control it, and not leave it to lay people or to indiscriminate men, medical men who are not even members of our Association.

It was with that in mind that we asked you to approve our resolution that we have passed. I think it is very important to give the committee a status in handling the situation.

During the past year I have been on the stand a couple of days in prosecuting one of these institutions, and at the present time there is still litigation from another concern in Minneapolis along this line. We have to carry ourselves very guardedly and carefully not to get into trouble, but we need your support and we need the support of the state association as well as the Ramsey County and the Hennepin County Societies. It is also advisable that the physicians throughout the state know a little more about medical technicians and where they stand. The country is taking on a new class that will run up into thousands of people who should not be doing the work they are doing, perhaps, but whose work should be done, largely, by medical men. These people are taking over some of the remunerative work some of the medical people ought to be doing. We are getting too many especially along this line. There is room for trained medical technicians, and a good place for them, and they are a great help to us.

We all have this report, but I simply call your attention to one or two things the committee has done. The committee has given you these resolutions which we hope you will pass. This committee urges the House of Delegates to pass these and thus enable it to give recognition to other state medical societies, to those schools of laboratory and X-ray technicians which will fulfill the requirements as stated in the resolution, governed by the American Society of Clinical Pathologists. The American Society of Clinical Pathologists and the Radiological Society of North America are working quite harmoniously with the American Medical Association. I feel that the Minnesota State Medical Association ought to do the same and help your committee to do something constructive along this line.

They have formulated this program to get out a series of articles to discuss the necessity of discouraging prospective students. There are too many in the field already. The importance of hiring only those technicians who are graduates of recognized and non-commercial schools of laboratory and X-ray technic; the vital importance of referring laboratory and X-ray work only to ethical laboratories supervised by competent medical directors or to ethical physicians who are specialists in these fields; the discouragement of the practice of many physicians who require their technicians to make diagnosis and to give treatments.

Your committee is convinced that the passage of these resolutions and the publication of these articles will do much to improve the present situation in the field of laboratory and X-ray technic. It will also permit the committee to answer authoritatively the numerous letters which are being received from prospective students of laboratory technic.

I have probably received and answered, during the past year, 300 of these letters which have come from people who have been fooled into this proposition by undesirable advertising.

Dr. Collins: The Reference Committee went over all this report and read all the different resolutions, and they felt there was so much technical language concerned with these resolutions and so much possibility of getting into legal entanglements, or treading on somebody's toes, that the matter was referred to the Council. This was taken up with the Council last night and discussed by them informally, and the Council will act further on it.

President Henderson: You have heard the report, gentlemen.

Dr. E. S. Boleyn (Stillwater): I move it be adopted.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Report of the Committee on Public Health Nursing.

Dr. Collins: I believe our recommendation was that the report be referred to the Council for action.

President Henderson: Your recommendation is adopted.

Dr. Collins: The Committee on Public Health

Nursing is having a meeting today, and asked for the privilege of reporting at tomorrow's session.

President Henderson: Report of Committee on Industrial Practice.

REPORT OF THE COMMITTEE ON INDUSTRIAL PRACTICE

Soon after the appointment of your Committee on Industrial Practice, the State Industrial Commission was notified of the purposes of our Committee by your secretary, Dr. Meyerding, and by the Committee Chairman. Very gracious replies were received. Many of the communications with the Industrial Commission have been in writing for permanent record and are on file with your secretary and the Chairman of the Committee. Also, copies of all correspondence between members of our Association, insurance companies, and representatives of the Industrial Commission have been filed for reference.

The Committee has carefully considered the individual problems brought to its attention. It realized quite soon that it could have no official or legal standing with the Industrial Commission. It has attempted

(1) To function as a voluntary liaison body between the insurance companies and members of the medical profession.

(2) To ascertain the type of problems which require our consideration, as a guide to future policy, and

(3) To accumulate some experience and make specific recommendation to the State Association regarding solution of the problems involved.

No instances have arisen where it has seemed necessary or advisable for the Committee to function in the matter of adjustment of charges for services rendered by a physician. In one case an insurance company, The Hartford Insurance Company (Sexton, Mordaunt & Kennedy, Attorneys) expressed its willingness to submit the question of reasonableness of charges made by Dr. Rudie of Mazeppa to the Committee for arbitration. The matter is still unsettled by the attorneys representing both parties and we were privately advised not to mix up in the controversy until the Industrial Commission had considered the contentions of both parties, regarding the charge for medical services. This is the only important case of its kind which has come up. We may still have opportunity to be of service in case the Industrial Commission will submit the matter to us for arbitration.

The question whether or not an insurance company may dictate limitations or methods to be employed by a doctor in treatment of an injury is not as serious as it might seem. We would refer to the memorandum from Dr. G. S. Wattam of Warren who enclosed a letter from the United States Fidelity and Guaranty Company. This letter was in no wise unreasonable, and simply specified use of ward beds and limitations and consultation advice before diathermy, baking, massage, and light treatment could be used, in order to reduce expense. It also specified ether anesthesia as a factor for safety. Dr. Wattam stated, "We feel that an injured patient coming to our office should be treated in such a manner as we deem best suited to the individual case." Upon submitting the matter to the Commission we were informed that the Commission agreed with Dr. Wattam. Nevertheless, the insurance company would have the privilege of changing medical attendants if any practitioner resorted to "padding" the treatment and rendering larger bills for what the company might regard as superfluous therapeutic measures. As all of us know, this is exactly what has occasionally happened. The insurance companies have reluctantly paid some large bills for special forms of therapy, but are careful to request advance approval of treatment the value or necessity of which may be questionable; or they have appointed doctors who do not routinely use such treatment.

Most of the correspondence in our files has to do with the right of the *employer* (usually the Insurance Company) to name the medical attendant of an injured employe. The Industrial Commission is definitely on record, committed to the opinion that the employer may nominate the medical attendant for his injured employe. In this opinion the Commission is supported by the State's Attorney General (see correspondence in files). To change this opinion or ruling of the Commission the State Medical Association would necessarily undertake either

(1) To appeal the decision as suggested in a letter from Mr. Williams of the Commission "in order that the matter may be definitely and finally decided,"

(2) To introduce a bill before the legislature changing the statute so that the employe could choose his own surgeon,

(3) To seek to secure appointment of men upon the Industrial Commission who would interpret the law in a manner favorable to the wishes of a majority of the State Medical Association.

In the report of the Chairman for this Committee before the midwinter session of the Council

(a) The first suggestion was an appeal from the decision of the Commission, the State Association to make an appropriation for legal advice and action. (Our present opinion regarding the advisability of such procedure is now modified.)

(b) Securing changes in the personnel of the Commission involves the State Association in a continuation of political or quasi-political activity which a certain element of the State Association seeks to avoid.

(c) Introduction of a new bill before the next legislature to change the statute should depend upon the wishes of a majority of the members of the State Association.

The following quotation from Page 43 of the considerations of the committee perhaps expresses the present situation:

> "However, there is some question as to the wisdom of securing any change in existing conditions so far as it concerns the ruling of the Industrial Commission regarding the right of Insurance Companies to name the surgeon for attendance of injured cases. From such information as has been available it would seem that Insurance Companies have every inclination to be conciliatory rather than arbitrary in the matter of adjustment of payment for medical service. The Industrial Commission has not been small in its attitude upon the subject and is inclined to be liberal to a reasonable degree in the matter of allowances for medical and hospital bills. With a changing personnel this may not always be the case. On the other hand, if the present system is changed, the State Association may be faced with a "Standard Fee Bill" such as is employed by the Industrial Commission in neighboring states; another step toward *State Medicine*. As stated in my midyear report to Dr. Workman and the Council, 'It is perfectly natural that some men put a higher value on their service than other men place upon their own service. Also it is obvious that one hernia operation, care of a fracture, removal of a cataract, or attendance upon an injury may involve very variable exactions in time spent, responsibility, and even in results, according to the individual circumstance. All of us know this so well that we can understand how difficult it is to try to get a common fee basis to cover conditions in injuries or operations in different individuals which have exactly the same name.' It is doubtful whether we would be as well off with a Standard Fee Bill as we are under present arrangements. and the Insurance Companies seem satisfied as things are now."

If any change in the statute is secured by legislation it might result in the employe's resorting to treatment by osteopaths, chiropractors, Christian Scientists, and other cults, a privilege he does not at present enjoy. Neither the medical profession nor the insurance companies are interested in a change which would permit such a contingency. It might lead to a very complicated situation resulting in overthrow of the entire system of compensation insurance, even to the institution of a new form of State Employment Insurance, with its possible political evils, and a socialistic involvement of our profession, leading toward "State Medicine." We believe this would be an economic calamity.

Your Committee therefore recommends

First, that the Committee on Industrial Practice of the State Medical Association be continued with reappointment of some of its present personnel.

Second, that the said Committee continue its study of the problems involved, accumulation of data and the practices and experiences of other similar medical bodies in other states.

Third, that no change in the statutes be attempted until more information is accumulated and submitted to the Council.

Fourth, that further friendly effort be made to induce the Industrial Commission by mutual understanding and coöperation to encourage a liberal attitude regarding choice of attending physicians for injured employes and compensation for medical service; to utilize the Committee on Industrial Practice in controversies in which the medical profession is involved.

Respectfully submitted,
Frank E. Burch, St. Paul, *Chairman.*
Arthur N. Collins, Duluth.
Alex. R. Colvin, St. Paul.
George Dunn, Minneapolis.
J. P. McDowell, St. Cloud.
J. C. Michael, Minneapolis.

Dr. Collins: Dr. Burch has gone. There was considerable to get us into some discussion on this report.

The Reference Committee makes these observations with regard to the report of the Committee on Industrial Practice:

"The question of fee schedules should be thoroughly discussed, and it is imperative in the face of present conditions for the organization to protect itself by attempting to get together on some agreement.

"The present financial situation demands that a careful study of the problem of fees and fee schedules be undertaken.

"Inasmuch as there seems to be considerable confusion in the minds of this group in regard to the question of fees, and as to the ethics of industrial practice, we recommend that either this committee or some committee appointed for the purpose, undertake a study of the whole question of fees as applied to industrial cases, and report at our next meeting on the advisability of a minimum fee schedule as applied to this work."

This matter was taken up before the Council last evening. They discussed it, and voted to refer the matter of an investigation of fees to this committee for further action.

President Henderson: This is an important committee, and I think they have done very good work, indeed. I think you get the gist of what has been said, and that is that this further problem of fees is referred back to this committee rather than to create a new committee. Heretofore the feeling of that committee has been that it was not within the field of their activities to talk much about fees or consider fees, but they acted more as a protective body between the industrial commission, insurance companies, and the practitioner. As I understand it now, Dr. Collins, this committee goes further afield and looks into the question of fees.

Dr. Collins: As I understand it, Mr. President, in this discussion that was had in the Reference Committee and also the discussion that occurred in the Council meeting last evening, a sort of canvass as to fees prevailing in the different districts throughout the state is desired.

It doesn't take very much for us to see that a man who operates on a traumatic hernia, if it is unquestionably traumatic hernia, out in some small town, will say, "Here is unquestionably a hernia, and I can do this," and he goes ahead and fixes it up and gets a nice fat fee, maybe charging $200. The insurance company argues that it is too high, that they can get all the hernias operated they wish, in the city, for $50, $75, $100, or what not. It is a jumbled up mess in every respect. I am just merely taking hernias as an illustration. It is the same with compound fractures, infected and non-infected.

The tendency of the insurance company is, apparently, to beat the doctor down. There are so many fee schedules being passed around through the profession for signatures that this whole thing is a matter for investigation for this committee. That is the reason the Council so voted.

Dr. F. H. Magney (Duluth): The insurance companies are always after us for fee schedules, which are dangerous things. A fee schedule for fracture of a leg might be a very nice thing in simple cases, or something that is very simple to take care of. But if you give a minimum fee schedule for fracture of the leg, and if you get a complicated one requiring a lot of time and service, they hold you to the minimum fee schedule. I think we should go very cautiously in outlining a minimum fee for the simple reason that they will hold us to that, and it is very difficult to get away from.

President Henderson: I have had conversation with Dr. Burch a number of times, and I think it is the responsibility of the committee to avoid any schedule of fees, if possible, and that is the effort.

Dr. C. B. Wright (Minneapolis): I would like to ask why societies could not organize and establish a minimum on certain well standardized procedures as hernia.

Dr. Adams: What results are they accomplishing where they have organized?

Dr. C. B. Wright (Minneapolis): I cannot answer that question but feel that it should be studied.

President Henderson: I know this is an important subject, and I think all of you have the gist of the thing, that it is recommended this committee try, by a gentlemen's agreement or some other arrangement, to establish, if possible, a tariff of fees that will be, more or less, reasonable.

It was regularly moved, seconded, and carried, to accept the report of the Committee on Industrial Practice.

President Henderson: Report of the Committee on Military Affairs.

Dr. F. L. Smith read the report of the Committee on Military Affairs.

REPORT OF COMMITTEE ON MILITARY AFFAIRS

At the special meeting held January 23, 1932, the Committee on Military Affairs recommended the following program to be presented to the Association for adoption.

(1) That all practicing physicians in the state of Minnesota, eligible to become members of the Medical Reserve Corps, should be canvassed through the County Societies.

(2) That a letter setting forth the importance of all eligible physicians to join the Reserve, be placed in the hands of Presidents of the County Societies.

(3) That all members of the Association and especially World War Medical veterans should use every opportunity to assist the State Association

Committee, which is endeavoring to educate all War Veteran Associations in the matter of care and hospitalization. This is of utmost importance to every community in which there is a local hospital.

(4) That the Presidents of the County Societies be forwarded a copy of the inclosed letter.

Regretting that the services of Major W. L. Hoffman, attached to the 88th Division, as medical instructor for the past six years, have been discontinued, the Committeen on Military Affairs recommends that the State Association request the Surgeon General, through military channels, that replacement be made as soon as conditions warrant.

Respectfully submitted,
Lt. Col. F. L. Smith, *Chairman.*
Major Martin Aune.
Major L. J. Holmberg.
Major W. L. Eklund.
Lieut. B. B. Souster.
Lt. Col. W. G. Workman.

Dr. Smith: Of course, we all know that a big cut is being made in the War Department, and that the amounts allocated to the Corps Areas are small, so that there is a reduced personnel in the Army and especially on the detached officers' leave. As Major Hoffman, who filled the office so well in the 88th Division, has been discontinued, we are recommending that when the time comes he be replaced, so that it will be a matter of record.

As to what the Reserve can do, we think, in times of peace, there is nothing here of any importance. Nevertheless, it is something. You will notice in the schedule shown by Dr. Braasch that the average physician in Minnesota is about forty-three years old. That was in 1914, and in 1931 it was about forty-six. That means that a great majority of the practicing physicians in the rural districts are coming in in the army age, up to thirty-five years of age as a maximum. Those are the men we have to get into the Reserve in order to keep the skeleton structure going.

Then the contacts of medical men who have been in service is very important regarding the Legion proposition. The average man in the country districts doesn't know what is going on. When some chap comes along representing the Legion and is trying to combat our program, if we had a medical man right in the community belonging to the Legion, he could help our program immensely.

Dr. Collins: No report.

Dr. J. M. Hayes (Minneapolis): I move the adoption of this report.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Report of the Committee on Cancer.

Dr. H. E. Robertson (Rochester): It isn't very fitting that the end hairs on the tail of the dog should wag the dog very long, especially at this hour.

REPORT OF COMMITTEE ON CANCER

Your Committee on Cancer was appointed by the president of the Association on March 8, 1932, and six days later, on March 14, your very active secretary asked that this committee make a report of the activities of the committee. Manifestly he is over-optimistic about the resources for activity and energy usually displayed by any committee for any purpose. Nevertheless, it would seem to be a fitting occasion to rediscuss some of the problems which have faced the medical profession and in the attempted solution of which your association has proved themselves to be actively interested.

At first thought, such activities as the State Association may properly sponsor would seem to be laid out along well worn and even hackneyed lines. As a minimum, whenever the subject of cancer is brought up, members of the medical profession meeting in august assemblies call attention to the deplorable increase of cancer morbidity and mortality, point with pride to the efforts of the profession to reduce this, and abjure each and every one to broadcast the fact that cancer should be treated early.

As a maximum, it is customary for some particularly enthusiastic representative of this group to arrange for public meetings at which the people are informed of the medical profession's enthusiasm for the curability of cancer and the extreme desirability of consulting the home physician on the occasion of lumps, hemorrhages, unhealed sores and indigestion.

But the questions facing us have become considerably more complex. Experts in the diagnosis and treatment of cancer tell us that the education of the laity has been carried on well apace with the times, perhaps even too vigorously, with the result that in many people a wholesome respect for the significance of some symptom or sign has been converted into a paralyzing fear of cancer which is quite capable of effecting more harm than would result from an actual carcinoma. Moreover, these experts hint in no unguarded terms that the foremost object of any educational campaign against cancer should be the family physician, whose indifference or lack of knowledge is frequently the cause for fatal delay in diagnosis and proper treatment. Therefore, they advise that we slow up the attack on the ignorance of the laity and transfer activities from patient to physician and that all along the line, beginning with the student of medicine, an intensive program of education be launched, emphasizing the proper diagnosis, prognosis and treatment of malignant growths.

But even these measures are inadequate. Supposing our patient, sufficiently educated, presents himself early enough and the doctor, sufficiently wide awake and well informed, recognizes the necessity for early intervention in a case of malignant tumor, what is the next step? How much does he know about what ought to be done in an individual case and if there are limitations in his knowledge or ability in this line, to whom should or could he turn for authoritative information, advice or assistance? In short, what are the resources in this state, for the proper diagnosis and treatment of obscure malignant conditions? But even if we are all well acquainted with these resources, what about the economic side? This patient is our patient and if we, ourselves, may feel unprepared to handle his condition to the best advantage, are we going to lose him entirely, because of transfer to those who appear to be specialists in treating this particular field? Furthermore, how can be allayed the suspicion that the major foundation for the whole program of cancer education lies in the desire for personal aggrandizement of those who either possibly or really deserve to be regarded as experts in the cancer field?

Your Committee has no panacea for the solution of these perplexing questions, but its recommendations may constitute a renewed effort toward some progress. We recommend, first, that you give your approval to the invitation already issued by the Council of the Minnesota State Medical Association to the American Society for the Control of Cancer to bring about a cancer survey of the state through their state chairman, Dr. Wm. A. O'Brien, and representatives of the national association, and further that every possible coöperation and effort be offered by the members of this Association toward facilitating the completion of such a survey. The Committee understands that this survey will analyze, with considerable exactitude, the resources afforded in this state for the care of malignant disease.

Second, that the State Medical Association, by appropriate resolution, recommend to the Dean of the Medical School that the medical faculty be urged to thoroughly review in their various courses before the students the subject of the diagnosis and treatment of malignant disease.

Third, that each county and district medical society be urged to devote at least one meeting a year to the discussion of malignant diseases in all their various phases.

Fourth, this committee be empowered to bring about at least once a year, a public meeting in every city and village of the state, at which the subject of malignant disease may be discussed by suitable members of the profession.

John Rothrock, M.D.
J. C. Litzenberg, M.D.
Arthur Collins, M.D.
H. E. Robertson, M.D., *Chairman.*

This committee has a report. It would have been a longer report and a good deal more blistering speech, but it is too late. The committee is too young, and the Society is not ready for it.

Next year, if the committee is in existence in its present composition, it will have a report that we hope will be advanced on the program and have a chance for consideration.

You are all sick and tired of hearing about cancer. You all know what cancer is, and you all know how to treat it. The trouble is, we don't know what cancer is and don't know how to treat it. We are facing a seriout situation in regard to cancer, as we are to other things, because cancer is understood and being judged by the laity in a way which is sometimes superior and paramount to the understanding and judgment of the medical profession. Some time or other we are going to have the laity force upon us the way in which cancer people should be taken care of. Unless we lead, we are going to have to follow.

There is going to be a survey in this state made by a cancer commission appointed from the American Society for the Control of Cancer, on the invitation of the Council of this Association. When that report comes in next year we will have some comments to make upon it, I hope.

President Henderson: Dr. Collins.

Dr. Collins: In view of what Dr. Robertson has just said, I don't know whether this review of our committee actually applies, but I am going to read it to you.

"The report of the Committee on Cancer suggests the prevailing inadequacy of diagnosis in cancer cases, and states that there is no panacea for the multitude of perplexing questions in this respect. The committee recommends that cancer survey throughout the state be brought about through the state chairman, Dr. W. A. O'Brien, and representatives of the National Association for the Control of Cancer, and that every possible coöperation be offered by the members of the Association. This committee will undertake this survey during the summer.

"Second, that the State Association recommend to the Dean of the Medical School that review of the courses before students on the diagnosis and treatment of malignant disease be stressed. Third, that each county and district medical society be urged to devote one meeting a year to the discussion of cancer. Fourth, that the Committee on Cancer be empowered to bring about at least once a year a public meeting in every city and village for the discussion of cancer.

"We recommend that we delete from the report, the following:

'Moreover, these experts hint in no unguarded terms that the foremost objective of any educational campaign against cancer should be the family physician, whose indifference or lack of knowledge is frequently the cause for a fatal delay in diagnosis and proper treatment. Therefore, they advise that we slow up the attack on the ignorance of the laity and transfer activities from patient to physician, and that all along the line, beginning with the student of medicine, an intensive program of education be launched emphasizing the proper diagnosis, prognosis, and treatment of malignant growths.'

"It is our opinion that the first and second recommendations should be accepted, but we believe the third and fourth are impractical."

President Henderson: You have heard the report.

Dr. Adams: I move it be accepted.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Amendments must be presented. Amendments to the by-laws can be voted on at the next meeting, but amendments to the constitution must be read at this meeting and then held over for one year.

Dr. Collins: "Article IV, Section 4: Affiliate members should be those members of component districts or county medical societies, who upon their own request, and having held membership for a period of twenty-five years in this Association, and having reached the age of seventy years, or who through physical disability are unable to engage in active practice, and who shall have been declared affiliate members of their own district or county medical society at its regular meeting, such action having been approved by the Council.

"Article V: House of Delegates: The House of Delegates shall be the legislative and business body of the Association and shall consist of (1) Delegates elected by the component county and district societies, (2) Councilors, (3) The President, (4) The President-Elect, (5) Ex-officio Secretary and Treasurer, (6) Past Presidents who shall be entitled to the privileges of the floor but without the right to vote.

"Article VI: Council—The Council shall consist of the Councillors, the President, the President-elect, the immediate Past President, and ex-officio the Secretary and the Treasurer. Besides its duties mentioned in the by-laws, it shall constitute the Finance Committee of the House of Delegates. A majority of Councilors shall constitute a quorum."

President Henderson: Is there any old business, or any new business?

Secretary Meyerding made some announcements.

Secretary Meyerding: We have a communication from Dr. Chesley in regard to the White House Conference. Do you want to take it up now?

Dr. F. J. Savage (St. Paul): I make a motion that this matter be referred to the Council at any future meeting of the Council.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Motion to adjourn is in order.

Secretary Meyerding: We will meet tomorrow noon at twelve o'clock in the Minnesota Club.

On motion regularly made and seconded, it was voted to adjourn at one-thirty o'clock.

Editor's Note: The committee reports, although not read at the meeting of the House of Delegates, appear in full, with the exception of the report of the Committee on Hospitals and Medical Education, which consists of a list of the short courses presented in various towns in the state and is omitted for the sake of brevity.

(Report of the second meeting of the House of Delegates will appear in the October issue.)

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HOSPITAL AND MEDICAL CARE OF VETERANS FROM THE VIEWPOINT OF THE DOCTOR

Morris Fishbein, M.D.
Chicago

As I listened to Mr. Cliff asking where the American Medical Association was way back in 1918, I thought about an old colored man standing on Michigan Boulevard in Chicago in the middle of January. He had no overcoat. The wind came down from the northwest, somewhere up in this section. As that wind hit the old colored man he shivered and putting his arms around himself he said, "Wind, where was you last July?"

There is no need to ask where the American Medical Association was in 1918. The American Medical Association at that time was just exactly where it is today. It had a membership comprising most of the competent physicians of the United States. It was the only body existing in the United States capable of giving scientific advice as to how to take care of a sick man, and it stood ready to give that advice to the President of the United States, to the Cabinet, to the Senate, to Congress, to The American Legion, or to any other group that wanted that advice. The American Medical Association stood then, as it stands now, ready to give of its utmost on request. No doubt it held off at that time from making approaches to these various organizations, as it has been somewhat delicate in holding off at the present time for fear that its motives may be misunderstood.

Exactly as the hospital association is being charged with having entirely a pecuniary motive in endeavoring to get the vacant beds filled with the veterans that ought to be in those beds instead of in government hospitals, so also the doctors are constantly charged in hearings before Congress with endeavoring to collect fees for themselves instead of having small salaries paid to physicians who work full time for the Veterans' Bureau.

The physicians of the United States do not yield to any other body in the United States in their patriotism. They do not yield to any other body in the United States in their desire to see every soldier who served in the war properly taken care of after that war is over. They want to see that every man—veteran or anybody else who needs medical care gets the best type of medical care that can be given to him. The best of medical care, I can tell Mr. Cliff and I can tell the Veterans' Bureau and I can tell everyone else, is not to be had anywhere except at the hands of a personal, private family physician. The best type of medical care is never given in any institution where men are brought in, standardized like robots, and treated like parts of a machine. The best type of medical care is never given to a man when that man is wrapped up in so much red tape that one can't even see the scars of his war injuries.

I don't care to repeat what happened in 1918 and 1919 when Brigadier-General Sawyer was scratching the top of his desk with his new spurs, hoping that everything would come out all right in the Veterans' Bureau. The doctors of this country know as well as anybody else what the Veterans' Bureau was in those days. It isn't a very happy topic for the Army, the Navy, the Public Health Service, the physicians of the country or the American Legion.

Since that time there has been some attempt to bring order out of the chaos which existed. If you want to know how much chaos still exists, you need merely read the hearings that took place in February, when Mr. E. V. Cliff appeared and when Dr. C. B. Wright, the chairman of the legislative committee of the American Medical Association, appeared for our Association, and when various representatives of the Veterans' Bureau and the Legion and the Hospital Association, and other bodies appeared. You will find there is still plenty of chaos in the control of veterans in this country. We are far from anything that resembles an orderly handling of this problem. I agree with Mr. Cliff that we must have an orderly handling, but no veteran should be permitted to suffer during the time that Congress is making this investigation.

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*Presented before the Minnesota State Medical Association meeting, Saint Paul, Minn., May 23, 1932.

It is not fair to the veterans of this country to say, "We will have nothing to do with the veterans until we get a commission to go out and study the whole problem, and write one of these long reports like the Wickersham report. Then after reading the fifty or sixty pages of it, we will know what kind of laws to pass." The veteran who is sick with an injury or illness arising from his service should not wait for a commission. He needs immediate attention, and the place where he ought to get that attention is in his home town from his family doctor. And the government ought to pay for it because he gave the government without asking at that time what the government would pay him.

The American Legion is concerned with the proper care of the individual soldier at the time he needs that care. That, of course, is also the concern of the American Medical Association.

As you look through the figures, you will find some remarkably interesting statements. There is one statement there by Dr. Griffith of the Veterans Bureau which says that the government pays $2.50 a day to take care of a well veteran in a soldiers' home, and $3.50 a day to take care of a sick veteran in a veterans' hospital. If there exists in the United States anywhere any hospital or any doctor who can take care of a sick man for only $1 more than it costs to take care of a well man, that is one of the greatest marvels of economy the world has ever known. That merely means that that sick man is not getting the medical care he ought to be getting because you can't do it for $1. You can't begin to give the type of medical care that a man needs for anything like that price.

It is like the fiction that is going around the country that we have to give all the people the best type of medical care for what they can afford to pay. They can't afford to pay for the best type of medical care. When they go down to the railroad station they can't all afford to pay to ride in drawing rooms and compartments. Some of them have to sit in day coaches. The same arithmetic applies wherever you try to standardize human beings and put them on a single level. You find that it cannot be done.

The Russian government thought they were going to abolish private practice. All physicians would be employees of the state and the doctor would be on exactly the same basis as anybody else. What happened in Russia? The people began to bootleg private practice. The man came around to the state doctor and said, "What is the matter with me?" The doctor told him and then said, "Your time is up. I have seventy or eighty other fellows I have to see today."

He said, "Doctor, if I could scrape together a few rubles could you see me after office hours for a little private attention?" Private attention may make the difference between cure and merely alleviation in certain types of medical cases.

The veterans are just like doctors and lawyers. There are a certain percentage of them who are likely to try to put something over on the government. There are a certain percentage of doctors who are likely to put something over on anybody who consults them, and there is a certain percentage of lawyers (I am not going to tell you exactly how many) who have to be watched a little more closely. I have been asked time and again about this particular point, and I always say that the percentage of doctors who cannot be trusted is just a little less than of ministers and lawyers.

As you read through these hearings of the Veterans' Bureau, and particularly some of the statements made by Brigadier-General Hines, Colonel Ijams and Dr. Griffith in the hearings before Congress, you hear time and time again the statement, "We can't trust those civilian doctors to see to it that the veteran is properly rated." Well, I looked through that rating book one time and they told me how long it took them to get that rating book together, that book you look through to find out how much a veteran ought to have. I am frank to say that Ely Culbertson and his wife Josephine both couldn't find anything in that book that would figure exactly right. It is difficult. I found in this book, for instance, that if a chiropractor's hands are injured he gets more compensation than a surgeon gets if his hands are injured. All of you know how delicate a decision that must have been. It has been said about a chiropractor that he gets $5 for doing what some other man would be slapped for.

I venture to say—and I say it in all confidence because I doubt that any other person knows the doctors of this country and their complaints any better than I do—that the average mine run of doctors in this country is as good as, if not quite superior to, the mine run of doctors employed by the Veterans' Bureau at the salaries that the Veterans' Bureau is able to pay. And if I were a soldier and disabled, and I had to pick a doctor, I think I would pick my family doctor above any doctor that the Veterans' Bureau has in its entire staff. That doesn't mean to say they are not good doctors. Most are graduates of good medical colleges. They have had hospital internships. They are quite able to give a veteran good medical care, but no doctor employed by anybody, by an industry, by a government, by a university, or by any corporation of any kind, can give a man the kind of personal and private attention that he can get from his own qualified family doctor.

We must realize and the Veterans' Bureau must realize that the physicians of this country are to be trusted with the care of veterans. They must realize that there has been progress in scientific medicine since the Spanish-American war. In 1900 there were 1,000 hospitals in the United States. Today there are almost 7,000 hospitals in the United States. In 1900 less than fifteen per cent of the hospitals in the United States had X-ray departments. Today more than eighty-five per cent of the hospitals in the United States have X-ray departments. In 1900 nobody knew what a clinical laboratory was. Today seventy-five per cent of the hospitals in the United States have adequate laboratories in which a man can get everything scientific medicine can give. It is not fair or right for the Veterans' Bureau, or anyone else, to reflect on the hospitals of the United States and say that these hospitals are not capable of giving as good service as can be had in a Veterans' Bureau hospital. Any hospital properly classified as first-class by the American Medical Association, by the American College of Surgeons or by the American Hospital Association is a hospital to be trusted.

Then the Veterans' Bureau say to The American Legion, and they hope The American Legion will believe them, "We can't put soldiers in private hospitals because they don't keep records." Anybody who has tried to come up against the inspection system of the American Medical Association and the American College of Surgeons on this matter of keeping records realizes that the records kept by any hospital properly rated by those bodies today are just as good records as can be found anywhere in the world. Incidentally, there is so much keeping of records that we had better consider whether or not the cost of medical care has not been considerably multiplied by the keeping, filing, storing, and indexing of unnecessary records.

The American people are recognized throughout the world as a free, independent, and individualistic people. The civilization of the American people is a civilization founded on the maintenance of the home and of the family as the unit of that civilization. Whenever you take a man who is sick out of the bosom of his family and send him 100, 200 or 300 miles away, and keep him there day after day, week after week, and month after month, away from his wife, his children, his mother, and all of those people who are so close to him and who want to see him in the time of his illness, you are striking at the basis of our civilization. There is stimulation that comes from knowing that somebody close to you is watching you and loving you and pulling for you to get out of your illness. There are two patients side by side with a pneumonia; one of them wants to get well because his family is pulling for him and wants him to come out of it; the other has nobody to care and nothing to look forward to but a life of a few years dragged out on a government pension; one wants to get well and the other doesn't care whether he gets well or not. The doctor says, "I may be able to do something with this fellow, but the other man hasn't anything of that left in him that comes from being in the midst of his family." He has a poor chance to get through compared with the man who has everything that personality and being human can give a man.

I am not arguing from the point of view of economy. I feel with Mr. Cliff that if it costs the government every last dollar it has, it is its duty to take care of any soldier with a service connected injury. It is its duty to take care of any soldier with a non-service connected injury if that soldier hasn't the money to be taken care of in any other way. It is the duty of our people to pay back those who went to the war and separated themselves voluntarily from their own people, who took the chance of losing their lives in order to protect the rest of the country, and who suffered serious injuries in their service. That is a duty of the government that cannot be delegated in any other way. It cannot be delegated back to the man's home town or to his state. It is a government obligation that he undertook, and it is a government obligation that must take care of him.

But I do say that the way in which he is taken care of is a matter of interest to the citizens of every state, a matter of interest to the citizens of every community. If he is taken care of in his own community he is going to be a good citizen of that community from that time on. But if he is shipped off to be taken care of somewhere else, he is no longer a citizen of his home town, no longer a member of his family, no longer a citizen of his state; he is just a ward of the government.

Do you realize that our government is developing more and more such wards? Do you know that the mental defectives are increasing in considerable numbers and have to be taken care of in institutions? Do you realize that the government is taking care of thousands of the soldiers of previous wars? Do you know that postal employees and government clerks are looking for free government care? As all of these people come back on the government taxes begin to roll up. The money moreover is taken out of the community where it ought to be left to take care of the sick in the hospitals that have been built in the community, by the doctors in the community, by the nurses in the community, by the warehouses and stores and institutions that supply the hospitals, the doctors, and the nurses. Now you realize we are getting away from local responsibility into a great centralized scheme that is likely to result disastrously for this country.

The doctors want to see to it that the veteran gets the best type of personal medical care that can be given to him. We are convinced that the people to give that to him in the majority of cases are his own family physician and the workers in the hospitals in his own community.

THE COMMUNITY HOSPITAL AND THE HOSPITALIZATION OF VETERANS*

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TONIGHT we are asked to consider the problem of the hospitalization of veterans from four aspects: (1) from the standpoint of the community hospital; (2) from the standpoint of the veteran; (3) from the standpoint of the public; (4) from the standpoint of the doctor. It seems to me feasible that a policy could be adopted which would conserve all four interests and guarantee to the sick or injured veteran the best possible service at the earliest possible moment of need, under conditions physical and mental which will promote recovery and convalescence, after efficient medical diagnosis and treatment, or surgical operation.

It is my problem to state the problem from the standpoint of the community hospital—that very useful sentinel of public health widely distributed over the land. It is your local hospital. There are, I presume, two fundamental questions: (1) what helpful, even necessary service can the community service render to the veteran efficiently; (2) what reactions will the national program of hospitalization of veterans have on the public health service of the community hospital immediately, and in the long run.

Hospitalization of Veterans' Illness due to Service.—Let us see first what are the conditions of the present problem. The national government has very properly assumed the obligation to provide for the hospitalization of any one of the four and a half million veterans who have suffered a disability due to war service, wherever that service was rendered. It adds very properly, too, disability allowance, the amount depending on the extent of the disability. With that policy there can be no dissent, but we frankly get onto debatable ground with the development of the program, and the policy that is asked for definition in legislation now before Congress.

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*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, May 23, 1932.

Opening Up Hospitals to Nonservice-Connected Cases.—In 1924 the situation had developed to such an extent that the veterans with service-caused disabilities did not occupy all the beds in the veterans' hospitals. In other words, by this time the government had provided sufficient hospital facilities for all cases of service origin, and there were a small number of vacant beds in Federal hospitals of the three types, psychiatric, tuberculous, and general. A policy of special consideration for the veteran was made to President Coolidge and accepted, which proposed that whenever there were beds available in the veterans' hospital, veterans whose disabilities were not caused by military service could use them. This was too reasonable a policy, particularly as the exact cause of physical disabilities might in some cases be difficult of determination as to its military origin. But the demand of these beds became great, and the Veterans' Bureau introduced a principle which the representative of the veterans' organization said was like waving a red flag in their faces. This principle was that these empty beds were made available to veterans who could least afford to pay for the hospitalization. Thus the principle of charity was introduced.

Hospital Service to Veterans Mandatory.—This step was followed by the authorization of an increased hospital building program. This was seen to be a tacit though not an explicit acceptance by Congress of a new policy, urged by veterans' organizations, namely, that the veteran as a matter of right and not of charity is entitled to hospitalization including medical and all supplementary service for all sickness or disability, whether its cause was due to the military service or not. This applies also to veterans of all wars. In this, as it has been very properly said, the benefits are based not on the veterans' *service,* nor his *need,* but on his *status.* The policy under discussion, therefore, is the right of the veteran as a veteran to hospitalization, including medical service for whatever illness or injury or other disability, whatever its nature or origin. This is a free national health and medical service to the four and a half million veterans as a national appreciation for a national service.

Classification of Cases.—This is the general development of the policy with reference to the hospitalization of veterans, from the care of veterans for disabilities originating in his military service, to his care for any disability whatever its nature or origin. But our problem will not be revealed until we classify the hospital cases of veterans. For the purposes of legislation or administration, the hospital cases are classified into three groups: (1) the neuropsychiatric; (2) the tuberculous; (3) the surgical and medical.

The Facts About Character of Cases of Hospital Load.—The general situation with reference to these three principal types of cases whose disability was of service origin, indeed as well as the rapidly increasing proportion of non-service connected cases is:

The tuberculous cases of service-connected admissions have decreased from 19,791 in 1925, and 14,166 in 1926, to 4,879 in 1931. On the other hand, the nonservice-connected cases have increased from 10 per cent of the admissions to over 55 per cent.

The neuropsychiatric cases of service-connected admissions have declined from 12,556 in 1925 to 6,681 in 1931. On the other hand, the neuropsychiatric cases of nonservice-origin has increased from 17 to 58 per cent.

The general cases of service-connected admission have declined from 31,222 to 13,058. On the other hand, the general cases of nonservice-origin have increased from 20 to over 83 per cent of the total.

Not Concerned with Neuropsychiatric and Tubercular Cases. It is conceded for the present that the neuropsychiatric and tuberculous cases of veterans might properly be cared for in veterans' federally-administered hospitals, though it might be suggested that if this is the policy, and it will undoubtedly involve added federal hospital facilities, this should be located and distributed so that in the absence of war in the next generation, these facilities might be made a part under proper auspices (not the Federal government) for the care of the civilian population.

Acute General Cases: Our Problem.—In the general cases, particularly of nonservice origin, or in the general cases of service origin, the Veteran Administration may now select civilian hospitals for such care. But if and when the nonservice-connected general cases are mandatory upon the Veterans' Administration, it is urged that this same discretion be lodged in the Veterans' Administration for the nonservice-connected general cases.

The Background of Facts of General Cases.—The United States has spent over $150,000,000 for hospital construction and equipment. It made an appropriation of $21,000,000 last year. It is estimated that from $50,000,000 to $75,000,000 will be needed in the next twenty-five years for the construction and replacement of hospitals for general medical and surgical cases.

It is estimated that there will be need of only 25,786 beds for general cases, of the approximately 60,000 needed. This number will rise to 37,718 of the 81,459 beds needed. The estimate of the Medical Council for 1950 is 67,371 general cases, but the difference will be taken care of in the domiciliary facilities of the Soldiers' Home. These figures are given in terms of beds needed. It should be clear that the number of admissions in each year will go into the hundred thousands.

The number of patients whose disability is nonservice-connected may be indicated. At present 60 per cent of cases of tuberculosis, 33 per cent of neuropsychiatric cases, and 83 per cent of the general are non-service-connected cases. In some of the hospitals this last figure runs now to 88 per cent non service-connected. The statistics show a rapidly increasing proportion of nonservice-connected cases.

The Special Problem.—Such is the situation as the statistics can present it. The problem I am asked to present to you for your consideration is the part the civilian and local hospitals can play in this program to take care of the hundred thousand veteran-patients annually suffering from nonservice or service disabilities, for whom the national government must provide. (It is said that 350,000 total hospital admissions for acute cases among veterans in 1931 may be taken as a minimum.)

The Specific Proposal.—The proposal in the interest of the veteran as well as the community hospital is that in emergency cases of the acute general type, the approved community hospitals may be used. These community hospitals may now be used for service-connected cases. Why not for nonservice-connected cases? These are the very hospitals these men and women would select ordinarily if there had been no extension of Federal hospitalization to the non service-connected cases. They are capable of rendering an adequate service to the civilian population, why not to that civilian population which is made up of former soldiers?

The Case for the Community Hospital.—The case for the care of veterans in civilian hospitals for those who are to receive hospitalization for disabilities or illness, whatever its nature or origin, is put quite effectively in the resolution of the American Hospital Association. This resolution points out that the use of community hospitals for the "diagnosis and treatment of injuries and illnesses will often prove advantageous to both patient and Nation," because of the following points:

"(a) The veteran may receive in an approved civilian hospital in his neighborhood the opportunity enjoyed by his fellow citizens for immediate treatment in the event of accident or acute illness without the necessity and danger of halting treatment for removal to the nearest government hospital;

(b) If referred to a civilian hospital the patient would not be subjected to separation from family, friends, and business environment during the period of illness and incapacity, as well as in the event of death, as would often result from reference to a government hospital;

(c) After the acute stage of illness he will not be required to remain at the hospital for necessary convalescent observation, prescription and care, instead of returning to his home thus eliminating additional distress to himself and additional cost to the nation;

(d) The patient will not be subjected to the dangers and delays of transportation; and the cost thereof to the nation will be avoided;

(e) The patient will be afforded opportunities for special and consultive professional care through the facilities provided by many of the large civilian hospitals which may be found in his neighborhood;

(f) The cost of maintenance and professional care in civilian hospitals should not exceed that of governmental hospitals, and the cost of construction and equipment of many large government hospitals, the need of which will gradually disappear in the course of time, will be avoided."

The Special Problem of Community Hospitals in Times of Depression.—There is a special problem in these days of depression that should be determined, but might very well be taken into account apart from the more fundamental considerations in determining the immediate policy of the national government with reference to the building of hospitals for the care of general cases. This special situation is the greatly reduced patronage of the ordinary civilian hospital, the financial difficulties that face them, and the possibility of a deterioration in service to the civilian with its ultimate bad effects on the general public health problem, at least so far as it is helped through hospitals. During the years 1930 and 1931, the equivalent of thirty-four beds out of every 100 beds in every civilian hospital in the United States stood vacant every day. The Federal government might materially aid this situation by providing under regulations for the care of emergency, medical and surgical cases of veterans in civilian hospitals, this stimulus to these local hospitals that may be the decisive factors in many communities in maintaining its public health service. At any rate, in these times it will be a great help. In any case it would seem to be wise that the utilization of these resources is the wisest economy from any point of view.

The Federal Octopus.—There is perhaps an even more fundamental question than any one that has been raised. We see the building up of an immense hospitalization service to four and a half millions of veterans of wars with a corresponding hospital building program. Unless we are assuming more wars, what is ultimately to happen to these buildings and this personnel? Will the old centralization disease, cancer-like, get a hold of us here in this beneficent work for veterans? Will the old Federal octopus with its bureaucratic tentacles try to justify itself and force upon us problems not of state medicine but of Federal medicine and Federal hospitalization? It may seem far-fetched and unreal, but all you have to do is to look over into the field of education to see what innocent and beneficent beginnings may do in the development of Federal power, Federal machinery, and Federal policy. Since innocent and beneficent Federal land grants became the basis of the immense education propaganda, why not beneficent service to veterans —"service disability," then for any disabilities, then why not for their families, and why not use existing facilities for the general population? I leave that thought.

Conclusion: Two Fundamental Outlooks.—I have presented to you the foregoing statistics of present services and probable needs, an analysis of the elements in the problems, and some suggestions growing out of these figures and analyses for the hospitalization of veterans in acute general cases in the community hospitals. The fundamental outlooks, implicit, though not formally stated, are: (1) that if the Federal government can in this case secure all the objects aimed at by the veteran legislation, and at the same time build up and reinforce community hospitals upon which localities depend for an essential health service, it should do so; (2) that there should go into a program involving so much money, affecting so many people, potentially dangerous or helpful to the community hospitals, constructive and intelligent planning to consider the whole problem including the welfare of civilians, particularly in view of the fact that the conditions will pass with time unless there are other wars. To your judgment I leave the problem, confident of your conception of the welfare of the whole people.

THE ZIFFERBLATT HAY FEVER TREATMENT

In May, a Philadelphia newspaper published an article with the headlines: "Hay Fever Stayed by Discovery Here. New Inhalant Immunizing Patient to Ravages of Disease Announced." The article opened with the statement that Philadelphia, long noted as a center of medical science, had added another triumph to her achivements by the discovery by one of her research workers, Dr. Arnold H. Zifferblatt, of "a 100 per cent successful treatment for hay and grass fever." Summed up, the situation seems to be: that Dr. Zifferblatt and his associates claim to have developed a treatment for hay fever that will give permanent relief for the season; (2) that no information regarding this treatment has been published in medical literature, but the widest publicity has been given it through the daily press; (3) that the composition of the drugs used and the methods of administering them are admittedly secret; (4) that at least a proportion of the public is being charged for this secret treatment, which is admittedly in the experimental stage. (Jour. A. M. A., July 16, 1932, p. 227.)

FRACTURES IN AND ABOUT THE NECK OF THE FEMUR*

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In fractures in the upper extremity of the femur involving the region of the neck there seems to be much confusion, as is apparent in the literature from articles by experienced surgeons who should possess a clearer knowledge of the subject. Not infrequently is seen in the same group a report of end-results of fractures in several different locations in which there is a vast difference, from a clinical, mechanical and physiological standpoint. In consequence there is less appreciation of the subject by the profession at large. This is often quite apparent when one hears a statement made by a physician that he employs some simple method of treatment of a case of fracture of the neck of the femur, and union was obtained in a short space of time, and walking resumed after two months. When this physician is closely questioned as to the exact location it is too often evident that he does not possess the slightest knowledge as to the behavior of fractures of this region. It is thus obviously essential that differentiation be made as to the exact site of the fracture in this region as the variation of a fraction of an inch may make a vast difference as to prognosis.

Various descriptions and classifications have been made, which are more or less confusing to the student. From these the following have been selected for this discussion:

1. Capital
2. Central { Complete / Impacted
3. Lateral
4. Intertrochanteric
5. Peritrochanteric
6. Subtrochanteric

Capital fractures are very rare and are due to direct violence which transmits force from the trochanter or shaft to the head causing more or less comminution with often sequestration.

Complete central or transcervical fractures are those which occur in the narrow portion of the head, and are usually entirely within the capsule of the joint though occasionally may extend a short distance beyond. When close to the head they are described as subcapital, though such a minute subdivision merely adds to confusion. They may be oblique or transverse. In an analysis of roentgenograms of 106 fresh fractures there were apparently 50 per cent oblique and 50 per cent transverse. The oblique type begins just external to the head on the superior aspect and extends downward and outward to about the junction of the middle and outer third of the neck. The transverse type extends at right angles across the neck, but are always irregular or digitated, never a square clean-cut severance as observed in the shaft of the femur. In this region there is rarely, if ever, any comminution as evidenced by loose fragments.

Impacted central fractures are those in which there is more or less telescoping of the distal into the proximal fragment with more or less rotation of the head or proximal fragment. Distinction must be made in those in which the fragments are merely engaged and those that are actually impacted. Some authorities do not recognize, from a scientific standpoint, the existence of this type, but fracture of the neck of the femur undoubtedly occurs in which the fragments are so closely attached that movements of the head within the joint may be made without eliciting motion at the site of fracture. And also the clinical course of this type is so different from those in which there has been complete severance that a special consideration is demanded.

Lateral fractures are those through the outer third of the neck of the femur and are transverse, being rather clean cut as if made by a saw. The anterior extremity of the fracture is within the capsule while the posterior extremity is extra-capsular, as the capsule does not extend over the entire posterior surface of the neck. They are so close to the trochanters that it is doubtful whether a separate classification is justifiable. Lateral fractures are more common in children than central fractures.

Intertrochanteric fractures are those which extend between the trochanters, but do not involve the trochanters materially. This fracture is more or less clean-cut and might also be described as fracture of the base of the neck, and, as in other types to be described below, is entirely extracapsular.

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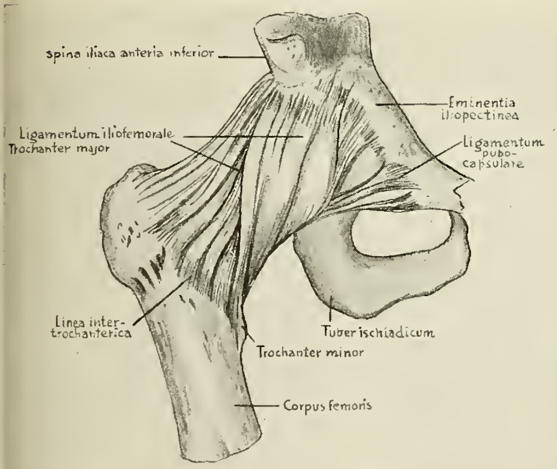
*Presented before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 24, 1932.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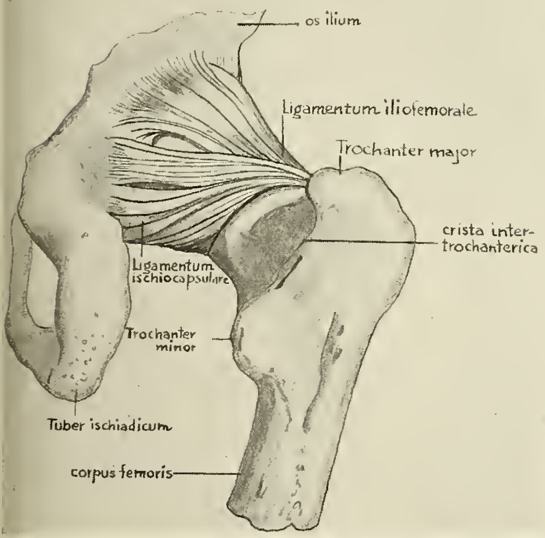
Ligamentum pubo-capsulare
Linea inter-trochanterica
Tuber ischiadicum
Trochanter minor
Corpus femoris


os ilium
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Tuber ischiadicum
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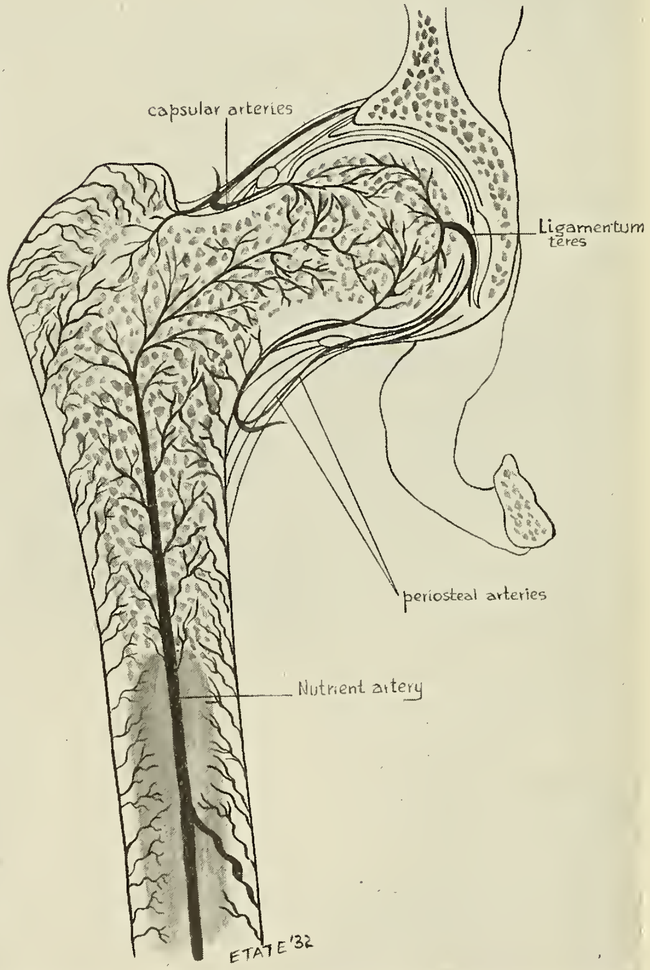
capsular arteries
Ligamentum teres
periosteal arteries
Nutrient artery
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Fig. 1 *(upper left).* Drawing of hip showing ligaments, anterior view, ligamentum iliofemorale or Y-ligament.

Fig. 2 *(lower left).* Drawing of hip, showing ligaments, posterior view, ligamentum ischiocapsulare, or ischiofemoral. This also shows considerable portion of the posterior aspect of the neck extracapsular.

Fig. 3 *(right).* Schematic drawing showing circulation to head and neck of femur.

Peritrochanteric are those which pass through both trochanters, usually breaking loose entirely the lesser trochanter, which is often displaced internally. These are more frequent than others of the trochanter and there is always much comminution.

Subtrochanteric fractures occur below both trochanters and are in reality fractures of the shaft of the femur and are not pertinent to this subject.

The old classification of intra-capsular and extra-capsular, though subject to some objections, gave a practical clinical knowledge of the subject, as it was then thought that those within the capsule did not unite by bone, while those external thereto unite without difficulty. Another classification which is even better is: cervical and trochanteric. The cervical fractures are those which occur within the neck proper, while the trochanteric fractures are those which occur in the region of the trochanters.

A thorough knowledge of the exact location of the fracture in question is most important for those in the region of the trochanters always unite by osseous union within from four to six weeks and present only a mechanical problem; whereas, central or intracapsular fractures unite slowly or fail to unite and are not only a mechanical but also a physiological problem as will later be demonstrated.

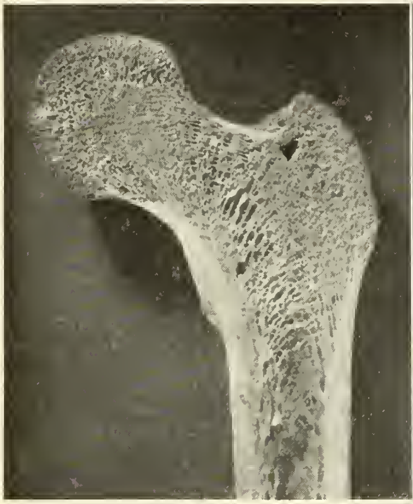
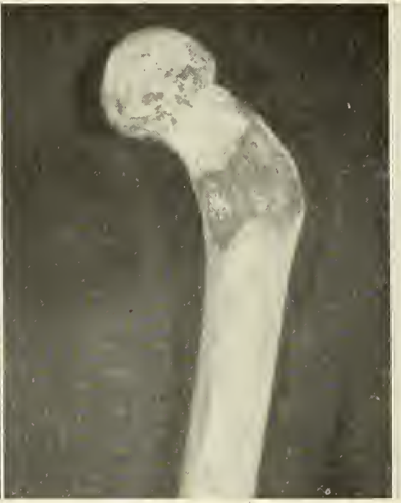
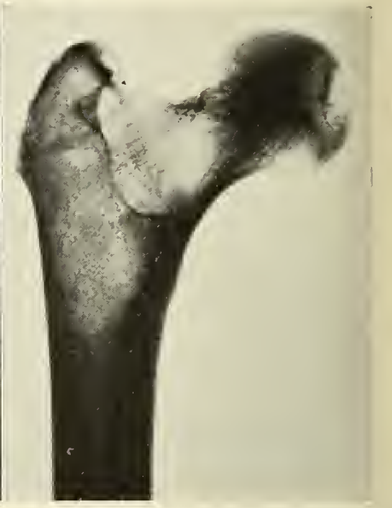

Fig. 4 *(left)*. Sagittal section of femur showing arrangement of bony trabeculæ.
Fig. 5 *(center)*. Femur from which greater and lesser trochanters have been removed, forming a mechanical crane.
Fig. 6 *(right)*. Roentgenogram of femur showing arrangement of bony trabeculæ, with the formation of Ward's triangle.

Differential diagnosis as to the exact location cannot be uniformly made without an X-ray, and to determine the exact relation of the fragments, stereoscopic roentgenograms are required. In all, the position of external rotation with elevation of the trochanter is usual, but there is much more pain in trochanteric fractures than those within the neck proper, and crepitation is more marked.

The important factors of anatomy and physiology of this region which are of practical value will first be discussed briefly. In the normal adult the neck of the femur forms an angle of about 125° with the shaft. In the aged this angle is often decreased and may at times be as low as 115°. The weight of the body transmitted through the neck to the shaft is thus placed on an oblique or curved axis, which, like the axis of a wheel, is mechanically efficient until impaired. The neck is also deviated forward at the junction with the shaft, forming an angle in the anterior-posterior plane of about 15°. The head of the femur and the acetabulum are thus on a plane anterior to the shaft and to the trochanters. Consequently, if a bullet enter the femur perpendicularly to the center of the greater trochanter it would pass below and posterior to the head of the femur, but if deflected upward at an angle of 125° and forward 15° the bullet would pass through the center of the femoral head.

If the greater and lesser trochanters are removed, the femur is seen to form a tubular curved lever, and according to Meyer and Cullman the trabeculæ of bone are arranged in the same manner as the trajectories of stress of a crane, being produced along the lines of tension and pressure. The pressure trajectories pass from the inner aspect of the shaft parallel with the inferior border of the neck into the head; the trabeculæ of tension pass from the external portion of the shaft parallel with the superior border. These cross each other at an acute angle of about 45° just distal to the head. Wolff applied this principle to other bones and organs of the body and developed his famous law of functional adaptation. Murk Jansen, of Holland, disputed this theory and pointed out that such lines are not analogous with the trajectories of a crane, since the trabeculæ in the neck of the femur cross each other at an acute angle, whereas, the trajectories of the crane cross each other at a right angle. Jansen believes that these lines are due entirely to forces of pressure and that tension has no material influence. Be that as it may, whether caused by pressure and tension or by pressure alone, this arrangement of the trabeculæ is constant and has a practical application to the subject. As these lines cross in the neck of the femur a triangle is formed in which there is less bone, producing a weak area which was described by Ward in 1838, and is known as Ward's triangle.

The hip joint is supported by powerful ligaments and muscles. The articular capsule is attached medially about the rim of the acetabulum, slightly nearer the rim below and posteriorly than it is above and anteriorly. At the femur the capsule is fixed anteriorly to the anterior portion of the greater trochanter, along the anterior intertrochanteric line, inferiorly on a level with the lesser trochanter, and posteriorly along the base of the neck of the femur above the posterior intertrochanteric line but leaving a space of about three-fourths inch extra-capsular. The thickness and strength of the capsule vary in different regions, there being three sets of auxiliary fibers, only two of which are of sufficient importance to be considered, *i.e.,* the ilio-femoral and ischio-femoral. The ilio-femoral or Y ligament of Bigelow is the strongest ligament in the body; it is attached above to the ilium immediately below and behind the anterior inferior spine and is inserted into the greater trochanter and into the anterior intertrochanteric and spiral lines as far as the medial border of the shaft of the femur. The ischio-femoral band arises from the ischium between the lesser sciatic notch and the obturator foramen and is inserted into the greater trochanter in front of the insertions of the pyriformis tendon and to the superior and posterior parts of the neck of the femur. The anatomy of the muscles of this region is well known, and requires no description, except to mention the powerful external rotators which play a definite role in these fractures. The gemelli and obturator intermus rotate the head of the femur backward after fracture. The psoas magnus and iliacus muscles pass over the neck of the femur and have been accused of being caught between the fragments in central fractures, although the probability of this is doubtful.

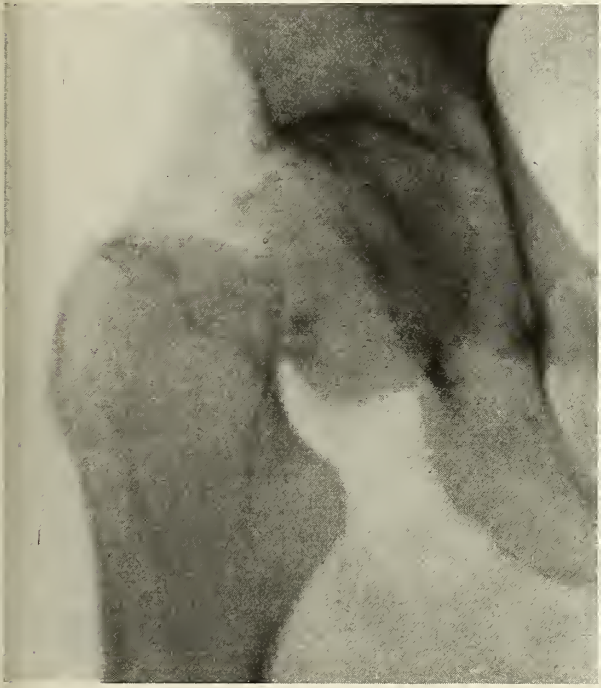

Fig. 7. Central or intracapsular fracture of the neck of the femur.

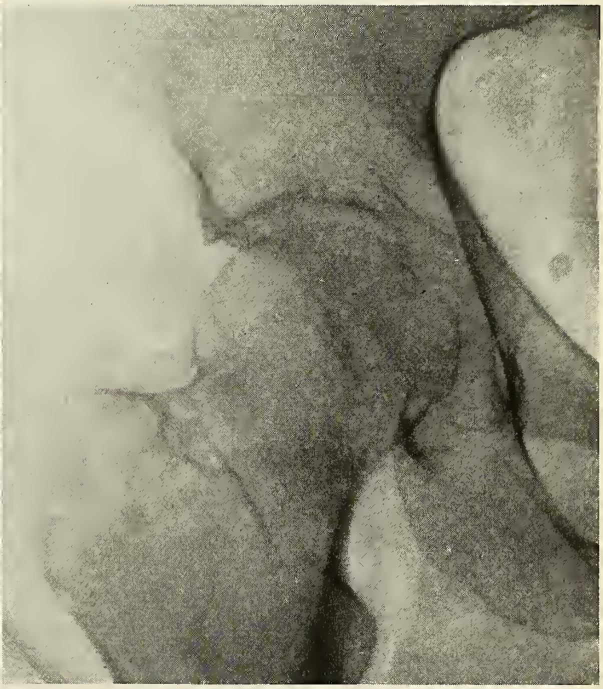

Fig. 8. Same as Figure 7. Solid osseous union. The head of the femur is living, as denoted by the structure being of the same density as the surrounding bone in the ilium and distal fragment. Also note physiological rearrangement of bone trabeculæ from change in direction of weight-bearing.

As an adequate blood supply is the most important factor in the production of callus, familiarity with the circulation is necessary to a thorough knowledge of the process of healing. According to Kolodny there are four sets of blood vessels to the head and neck of the femur:

1. Those from the shaft which enter from the superior nutrient artery and pass through the

neck to the head, although only a small number penetrate to the epiphysis.

2. Periosteal, which pass superficially along the borders of the neck into the head. As the existence of periosteum on the neck of the femur is disputed, these vessels should probably be called synovial as they must pass in the deep layers of the synovial membrane which is reflected over the neck.

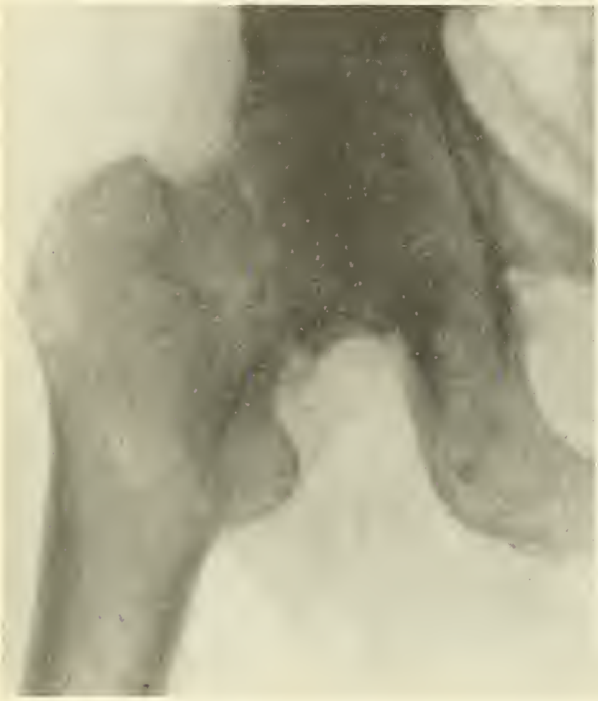

Fig. 9. Fracture of the neck of the femur two months after reduction, showing increased density of the head as compared to that of the trochanter, indicating probable aseptic necrosis.

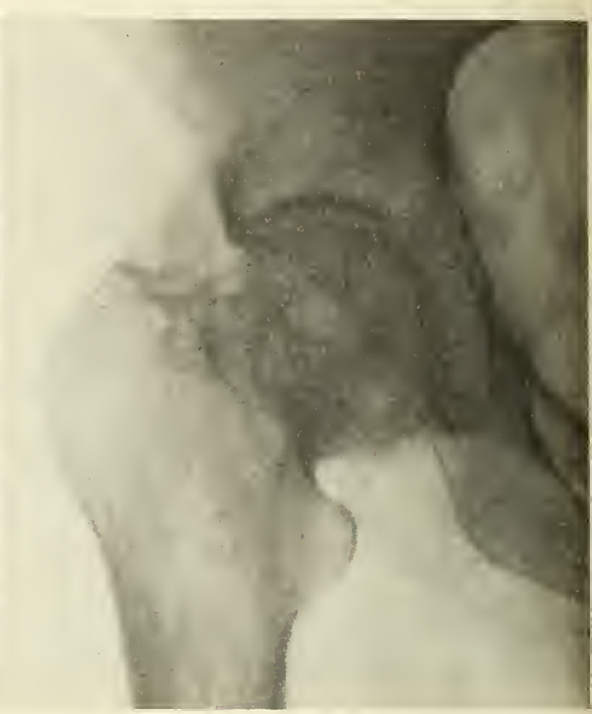

Fig. 10. Solid osseous union with mottling of the head, showing probable gradual substitution of a dead head by new bone.

3. Epiphyseal, which pass to the epiphysis from the capsule below and the subdigital fossa above.

4. Those from the ligament teres which enter the head at the depressed area known as the fovea. After a complete fracture this vessel is the sole source of blood supply to the head of the femur until collateral circulation is reestablished, as all other vessels are severed.

When fracture occurs the limb or outer fragment is rotated outward and displaced upward. Outward rotation is produced by three forces: (1) the reflex contracture of the powerful abductors and external rotator muscles; (2) by the ischio-femoral ligament which is made tense as the fragments separate; and (3) by the force of gravity which is influenced by the angle of attachment of the foot to the leg. The distal fragment which is the shaft of the femur is displaced upward by the gluteal muscles, being completely separated from the proximal fragment or head. The head is usually rotated backward by the abturator internus and gemelli. In trochanteric fractures external rotation of the distal fragment is largely due to the force of gravity alone, and thus there is less rotation of the proximal fragment.

Of 304 fractures of the region of the neck, 157 were central or within the neck proper, and 147 were trochanteric. The incidence of occurrence is 51.7 per cent central and 48.3 per cen trochanteric. The average age of occurrence of central fractures was 64.1 per cent, and of trochanteric 64.2 per cent. The average age incidence is, therefore, apparently the same, but trochanteric fractures are of much more frequent occurrence in young adults, whereas, central fractures are quite rare. If we consider the occurrence above the age of 60 years, of 148 fractures in this region, there were 47 central fractures and 101 trochanteric fractures, the average ages being trochanteric 74 years, and central fractures 72 years. Fractures in the region of the trochanters are over 100 per cent, therefore, more frequent than central fractures in the aged.

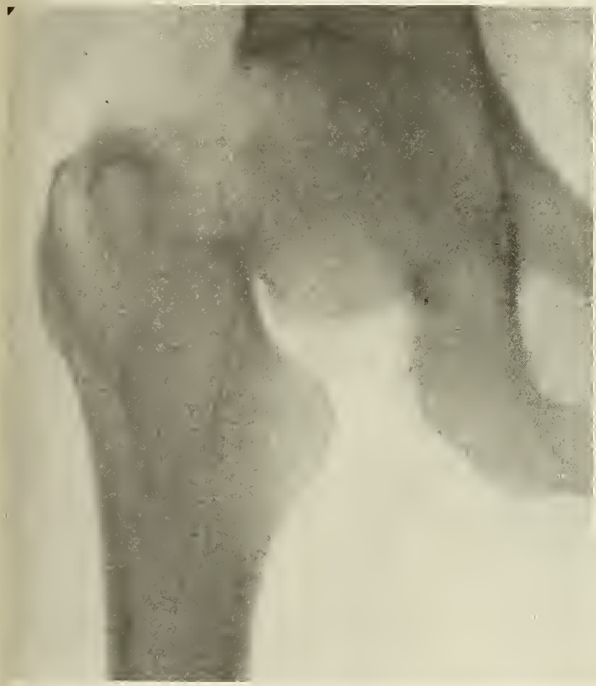

Fig. 11. Fresh fracture of the neck of the femur in patient, age fifty.

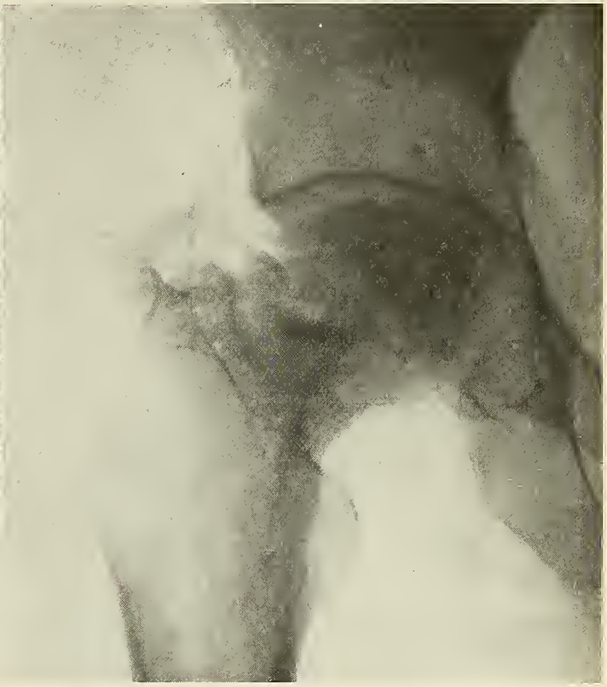

Fig. 12. Same as Fig. 11, two years and three months after operation. Solid osseous union in a dead head in which there was sequestration and flattening of the upper portion of the head.

Later fractures of the neck, intertrochanteric and peritrochanteric, give infinitely better results than those within the neck. With any form of treatment, however, much better function can be secured if anatomical relations are maintained. Some form of traction should be employed, otherwise it is impossible to maintain the angle between the neck and the trochanter, and coxa vara or decrease in the angle will result with more or less permanent disability. Also there is a marked tendency to external rotation unless prevented by mechanical apparatus. The author follows routinely the following technic:

The patient is placed upon a fracture table with the limb in moderate abduction with slight internal rotation. Traction is then made until perfect reduction is secured, confirmed by a roentgenogram. Adhesive strips, as for Buck's extension of the hip, are applied, and finally a plaster cast from the nipple line to just above the ankle on the affected side. The patient is then placed in bed with weight and pulley traction of about 20 to 30 pounds, so arranged that the position of the patient can be changed. This is accomplished by having a pulley in the usual position at the foot of the bed and one at a higher level which permits the turning of the patient upon the side.

At the end of three or four weeks the cast is removed, and union is found to be so firm that no motion can be detected between the fragments. This is due to the fact that there is abundant blood supply to all fragments, and there is excessive comminution which gives extensive raw osseous surfaces conducive to hallus production, and also the fracture involves cavernous bone which is rich in osteogenic properties. A second cast is then applied from toes to nipple line, with a joint inserted at the knee to permit active and passive movements. At the end of six to eight weeks the cast is removed. Walking on crutches is permitted at the end of ten weeks, and gradual increase in weight bearing in three months, after which crutches are discarded as soon as feasible in the individual case. The after-care is essential to prevent angulation from early weight bearing.

In the very aged or debilitated the cast may be removed at the end of three or four weeks when a simple brace is applied to prevent external rotation and the patient is placed in a rolling chair. In these it is not always possible to prevent slight angulation and external rotation, but as union always occurs there will be good function, and the mortality will naturally be decreased.

No estimate has been made of the end results in fractures in the region of the trochanters, but undoubtedly there are many in which decrease in angle, coxa vara, decrease in length and external rotation causes a marked limp and impairs function of the hip joints. In those inefficiently treated the deformity may be so great as to render walking without crutches impossible. In those treated by any method of efficient traction, practically perfect function should be secured.

In complete central fractures the same physiological conditions prevail as in all fractures but there are many additional factors which may impair the evolutionary process of healing which may be summarized as follows:

1. As age advances there are certain physiological changes in all tissues. The evolutionary changes in bone impair regeneration of bone, cause depression of the angle of the neck of the femur, bone atrophy and impaired circulation.

2. Inefficient reduction, fixation and protective after-treatment impair osseous union and definitely induce in a short period of time a status of non-union.

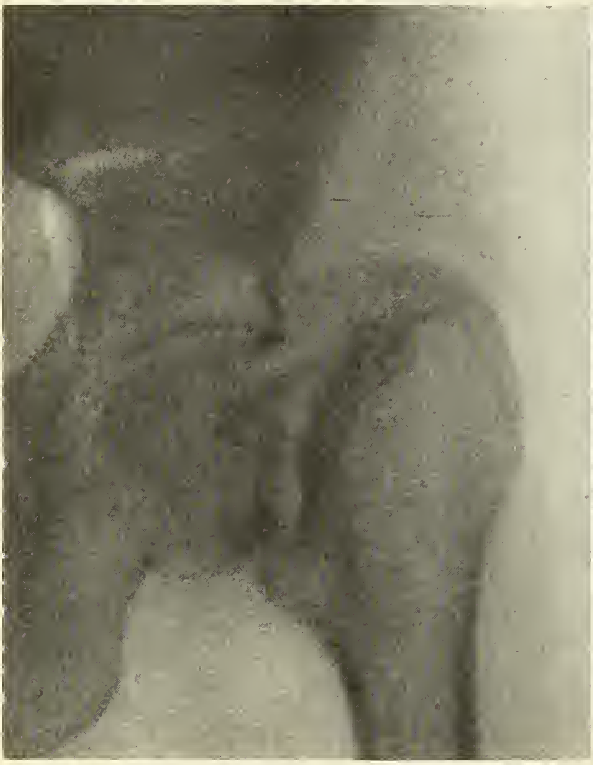

Fig. 13. Ununited fracture of the neck of the femur. Density of the structure of the head as compared to that of the trochanter indicates that head is probably dead.

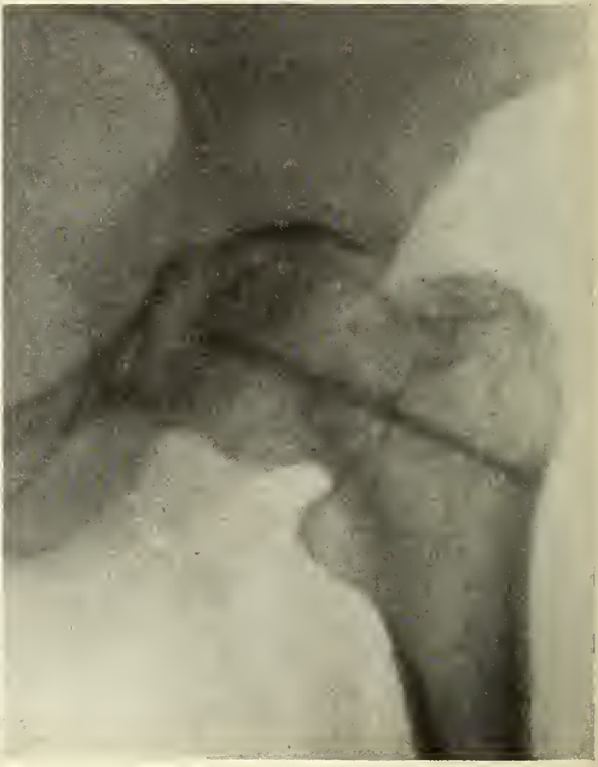

Fig. 14. Fracture of the neck of the femur five years after hone graft operation in which dead head has been entirely restored to normal bone by gradual substitution.

3. The circulation to the head of the femur is diminished. The lumen of the vessels of the ligamentum teres is usually diminished or obliterated.

4. Weight bearing of the body is transmitted on a more or less transverse plane through the site of fracture.

5. Any movement causes a shearing action at the point of fracture which is always conducive to the organization of bone on the surface of the fragments and not across the line of fracture.

6. The normal process of union is impaired, as callus is derived chiefly from the distal fragment. All callus is intermediary, there being no reaction on the part of the periosteum, since there is no periosteum on the femoral neck.

7. Union is always delayed when compared to other fractures and a permanent status of non-union occurs in those not reduced in approximately 30 days.

8. Functional use before nature has had sufficient time to firmly consolidate new bone, impairs or may even cause disintegration of the reparative process.

9. Synovial fluid has a possible deleterious action upon callus production.

10. The head is a terminal fragment in which union often fails elsewhere in the body regardless of age, for example, in fractures of the external condyle of the humerus.

11. The blood clot which is essential to early bone regeneration is said to be deficient in this fracture.

12. The physiological reparative process differs from that of other fractures to such a degree that it may be regarded as pathological. This is chiefly in the behavior of the head or proximal fragment. In the opinion of Sir Astley Cooper the head always becomes necrotic and does not unite by bone. Axhausen and Bonn at the present time also contend that the head becomes necrotic. However, Santos has made an exhaustive investigation as to the reaction of the head which explains more clearly the pathology. These changes deducted from the investigations of Santos may be enumerated as follows:

The head may remain alive as indicated by roentgenological examination which demonstrates that the bone structures may become atrophic to the same degree as the surrounding bone in the ilium and the trochanters, or the head may die and become a sequestrum as demonstrated by the structure of the bone remaining the same as at the time of death or fracture. The sequestered head, therefore, remains much more opaque or dense, standing out in marked contrast to the surrounding atrophic tissue.

Microscopic examination of the living head demonstrates atrophic changes; the trabeculæ become thinner and the marrow spaces are increased in size and substituted by fat. The articular cartilage becomes thinner and the subchondral marrow spaces may so enlarge that the encrusting cartilage sinks below the surface, thus causing irregularity of contour in the head. Microscopical examination of the necrotic head demonstrates the usual characteristics of dead bone, in that the lacunæ are empty and the staining quality of the cells present is impaired. Fibrous tissue invades from the fovea which is probably instigated by the vessels of the ligamentum teres. New bone is formed by this tissue until the entire head or any portion thereof is restored to living bone. The articular cartilage dies, undergoing fibrillation and is exfoliated and absorbed. Adhesions from between the head and acetabulum from which there may be further invasion by fibrous tissue which becomes converted into bone.

When the living head unites, the structure of the bone is gradually restored to normal in the same manner as the surrounding osseous tissue, as function is increased. When the living head fails to unite there is gradual atrophy until only a small portion may remain. When the dead head unites, the entire head will be gradually invaded by new bone from the fovea and from the distal fragment or a portion may be extruded as a sequestrum into the joint. Thus the globular contour of the head may become more or less incongruous. When the dead head does not unite the size becomes diminished by a process of erosion and is usually invaded by new bone until the entire structure is restored, after which the density and appearance are the same as that of the living head and the surrounding living tissue.

A careful review of the roentgenograms in 126 cases have been made to estimate the reaction of the head after complete central fractures. In 108 the head remained living, and in 18 the head was dead. In those in which the non-union had existed for a long period of time it was impossible to estimate the behavior of the head as many of the dead heads are restored to normal bone by a process of substitution as above described and, in consequence, are identical with those which have remained alive from the time of the fracture. In impacted fracture the head, in all cases, remains alive as the circulation is not completely severed.

In most fractures the degree of union can be determined much earlier by physical examination but in complete fractures of the neck of the femur it is both difficult and unsafe to attempt to ascertain osseous fusion in this manner. The roentgenogram, however, is our efficient guide and the significant factors determining union may be enumerated as follows:

1. Relation of the fragments as denoted by the status of the angle of the neck after reduction as demonstrated in the antero-posterior view, and also the position of the proximal fragment or head which can only be determined by stereoscopic roentgenograms. If there is no change in these relations by the end of four months the indications are favorable to union, but this does not imply that union is certain. If there is a change in relations, as denoted by a decrease in the angle or change in rotation, union is doubtful but not uncertain so long as there is close approximation. Decrease in the angle with separation of fragments indicates almost inevitable non-union, which may be apparent as early as eight weeks. In those in which there has been no approximation, the status of non-union exists at the end of four weeks. Although it has been proven that union may be secured by simple approximation even at a later date, the chances are small.

2. Condensation of bone on the raw surfaces of the fragments indicates delayed union, and if associated with separation of fragments, non-union.

3. The structural changes when union is progressing satisfactorily is that there is no apparent external callus and there is the gradual formation of the new osseous lines of stress across the area of fracture which is rarely perceptible until the lapse of four months, and not well developed until the end of six months, and in some instances even much later. The arrangements of the new trabeculæ are never the same as normal, for, regardless of the accuracy of reduction there is always some change in the relation of the fragments as a result of absorption of the surfaces of the bony fragments. These new lines invariably begin just external to the lesser trochanter and pass directly upward through the head to its superior aspect and the upper wall of the acetabulum. Ward's triangle is thus entirely obliterated and replaced by new bone. In those in which there has been condensation along the line of fracture, the process of union is more delayed as in fractures elsewhere in the skeleton, and the physiological lines of stress are not apparent until a much later time.

The progress of union is determined, therefore, during the first four months by the anatomical relation of the fragments. After four months the progress is determined by both the anatomical relation of the fragments and the structural changes as above described. In a very high percentage, six months or more will elapse before union can be determined. The conclusion that union has occurred prior to six months is too frequently made, which leads to false security and often non-union by improper care.

When the head is living, union takes place in less time than when the head is dead, other conditions as age and structural quality being equal. In a dead head, in addition to union, there must be also substitution of the entire head by new bone, which may require many months.

Many methods have been employed in the treatment of fractures of the neck of the femur, operative and non-operative or conservative. The exponents of the operative methods claim that on account of rotation of the head, satisfactory approximation and fixation is improbable, and also with internal fixation earlier function is permissible. The object of all open operations is to transfix the head and neck of the femur by nails, screws, ivory pegs, beef bone, etc. These are inserted from without inward below the trochanter through the neck into the head of the femur. The results from these methods have not been uniformly satisfactory, nor has there been a sufficiently large number of cases reported by a sufficient number of surgeons to cause a general adoption of any of these procedures. The author has employed open methods in approximately six cases of recent fractures. In three the beef bone peg was employed, with one successful result and two failures. In two, steel nails were employed without success. In one, an autogenous bone graft from the tibia was used with excellent result. The excellent results in these two cannot be attributed solely to the open method as the abduction treatment was also employed. It is probable that if any open operation is indicated the autogenous graft gives the best chance of success, as no foreign material is inserted and the graft is osteogenetic.

Recently Smith-Petersen, of Boston, has devised a three flanged nail which is most ingenious, as it prevents rotation of the head, and more firmly fixes and approximates the fragments than any of the methods above mentioned. In order to secure satisfactory reduction he states that the hip-joint must be widely exposed.

His results in a small number of cases at varying ages have been encouraging, but the end results in a large number of cases with different surgeons must be reported before the real value of this method can be estimated.

The conservative methods in which osseous union has been secured are the Ruth, Maxwell, Bardenheuer and the Whitman abduction methods. The Ruth, Maxwell, and Bardenheuer methods maintain reduction by means of traction to which reference can be made. The method of treatment which is more generally accepted and which I have routinely employed is the abduction treatment, which consists in abduction to the limit, which is 135°, complete extension and moderate internal rotation. In this position a plaster cast is applied extending from the toes on affected side to nipple line, and down to just above knee on normal side. As an adjunct to the abduction treatment, artificial impaction, as advocated by Cotton, has also been employed in a number of cases. A careful routine after-treatment is essential and must be adjusted to the conditions found in each case. At the end of eight weeks the cast is removed and roentgenograms made. Almost invariably the roentgenograms will show at this time that the position of reduction has been maintained. A second cast is applied from toes to nipple line in the same position but omitting the cast on the unaffected side. A steel lock joint is placed at the knee joint in the second cast so that active and passive motion may be given to the knee, but at other times the joint remains locked to continue complete fixation. At the end of the third month this cast is removed and an abduction hip brace applied, with lock joint at the knee and the joint made immovable at the hip. During the fourth month the patient is permitted to be lifted into a rolling chair. At the end of the fourth month the joint at the hip is unlocked and the patient permitted to sit up in bed and in a rolling chair. At the end of five months the patient is permitted to walk with the aid of crutches and wearing the protective brace on which most of the weight is borne on a Thomas ring. Roentgenograms are made from time to time to determine the degree of union and protection is gradually discarded as union progresses. Not until the new trabeculæ have passed across the line of fracture is apparatus discontinued.

As soon as the patient has recovered from the acute symptoms of the fracture, muscular exercises are begun which consist of contracting the muscles of the thigh and leg with especial attention to the quadriceps muscle. Gentle passive and active movements are instigated in the knee at the end of eight weeks and are gradually increased after the brace is applied. Physiotherapy is given to the hip and thigh muscles when the second cast is removed and the brace is applied, but not until the end of the fourth or fifth month is movement permitted in the hip-joint and this is commensurate with the degree of union. In most instances the brace is discarded by the end of eight months, but in those with delayed union protection has been continued for as long as eighteen months. In the average case one year is required before the patient can assume the same duties as at the time of fracture, although much, of course, depends upon the status of the individual.

A clinical examination is carefully made when the first cast is removed and subsequently at thirty or sixty day intervals. Not until the end of the fourth month is the hip freely moved and then no force is used. Dependence must be placed chiefly upon the roentgenogram. As bone atrophy is decreased and the structures return to normal, function is increased. The degree of union cannot be determined with safety by manual examination until the elapse of six or eight months. Non-union, however, can often be determined at a much earlier date by the roentgenogram and symptoms of pain, especially in the muscles of the thigh, and instability, crepitation and pain on movement at the point of non-union.

Impacted fractures require fixation only by splint or apparatus and unite at a much earlier date. Apparatus may usually be discarded at the end of three months, but fixation and protection is required in these as complete fractures have been caused by too early weight bearing, and a comparatively simple condition converted into one much more serious. Numerous malpractice suits have arisen in such cases when the fracture was unrecognized and no roentgenogram was made at the time of fracture, with the result that there was subsequent separation of fragments on persistent weight bearing. In consequence, no injury of the hip in any individual over the age of forty should be viewed lightly, and in all cases a roentgenogram should not only be suggested but demanded. All impacted fractures of the neck of the femur unite if protected a sufficient length of time, unless death ensues from some complicating disorder.

The main objection to the abduction or any other closed method of treatment is the necessarily prolonged confinement, but this is apparently required by nature, and until some method can be devised that will hasten the reparative local process so that osseous union will be secured in a shorter space of time, and also increase the percentage in which union occurs, no further improvement can be expected. Prior to the abduction treatment the possibility of osseous union was generally doubted. In consequence, from the number of cases in which osseous union with excellent function has been proven beyond the shadow of a doubt, it must be admitted that a material advance has been made.

Statistics as to results of complete central fractures of the neck of the femur vary to a considerable degree, and at present pessimism prevails with quite a number of surgeons which is probably due to the fact that the necessarily prolonged fixation without weight bearing as described above is not always employed. Estimation of true end results are secured with great difficulty, and fallacies may arise even under the most careful supervision, as has been my personal experience. This is largely due to the difficulty of following each case closely with successive roentgenograms and physical examination for a period of at least eighteen months to two years. In this report only those in which such a record could be most accurately secured over a period of two years or more are considered. In consequence quite a number have been discarded.

In impacted central fractures and in those in the region of the trochanters the results may be determined in a much shorter period of time.

The following tables demonstrates end results and important factors of fractures in and about the neck of the femur.

TYPE OF CENTRAL FRACTURES

Transverse	48
Oblique	52
Dentate	6

CENTRAL FRACTURES OVER 60; LIVING CASES

Solid union	19
Doubtful union	5
Fibrous union; good function	5
Non-union	18
Total	47

IMPACTED FRACTURES OF NECK; LIVING CASES

Solid union	25
Doubtful union	0
Fibrous union; good function	0
Non-union	0
Total	25

CENTRAL FRACTURES UNDER 60; LIVING CASES

Solid union	21
Doubtful union	0
Fibrous union; good function	0
Non-union	6
Total	27

CENTRAL FRACTURES UNDER 60

Total	54
Average age	48.3 years

CENTRAL FRACTURES OVER 60

Total	100
Average age	72.69 years

TROCHANTERIC FRACTURES UNDER 60

Total	36
Average age	44.66 years

TROCHANTERIC FRACTURES OVER 60

Average age	74.3 years
Total	101

MORTALITY OF FRACTURES IN AND ABOUT HIP

	Number	Died	Per cent
Intertrochanteric	147	22	15
Central fractures	115	15	13
Total	262	37	14

COMPLETE CENTRAL FRACTURES OVER 60

Age	Total	Solid Per cent	Fibrous Union; Good Function Per cent	Doubtful Union; Good Function Per cent	Non-Union Per cent
60-69	22	12—50	2—8	1—4	7—29
70-75	15	6—40	1—6.6	2—13	6—40
Over 75	10	1—10	2—20	2—20	5—50
Total	47	19—40.4	5—10.6	5—10.6	18—38.3

COMPLETE CENTRAL FRACTURES WITH AND WITHOUT ARTIFICIAL IMPACTION

	Artificially Impacted	Not Artificially Impacted
Solid union	17	17
Good function; fibrous union	0	2
Doubtful union	1	0
Non-union	8	7
Total	26	26

COMPARATIVE END RESULTS OF CENTRAL AND TROCHANTERIC FRACTURES

	Average Age	No. of Cases	Solid Union	Doubtful Union Per Cent	Fibrous Union Per Cent	Non-Union Per Cent	Good Function Per Cent
Trochanteric	66.4 yrs.	125	125 (100%)	0	0	0	125—100
Complete central	64.1 yrs.	75	40 (53.3%)	5—6.6	6—8	24—32	51—68
Impacted central	64 yrs.	25	25 (100%)	0	0	0	25—100

The mortality is higher in trochanteric fractures than in central fractures, if estimation is made of all cases regardless of age. Of 147 trochanteric fractures there were 22 deaths (14.9 per cent). Of 157 central fractures there were 16 deaths (10.2 per cent). But in the elderly, over the age of sixty, the death rate is higher in central fractures than in trochanteric fractures. Of 47 central fractures there were 15 deaths, or 32.1 per cent, whereas, in 101 trochanteric fractures there were 22 deaths, approximately 22 per cent. Mortality is exceedingly low in all below the age of sixty, there being only one case in central fractures and no deaths in trochanteric fractures.

Fifty-three per cent of complete central fractures, 100 per cent of impacted central fractures unite with efficient treatment by osseous union. One hundred per cent of trochanteric fractures unite by osseous union, with or without treatment; therefore, it is quite evident that osseous union may be expected in a high percentage of fractures about the neck of the femur. But it is also evident that there is only one type, notably complete central fractures, which present a difficult physiological problem by which union is secured with difficulty, and the necessity of differentiating the results and other factors in this type is obviously essential to avoid confusion and to promote a better knowledge of the subject.

DISCUSSION

Dr. Emil Geist (Minneapolis): Dr. Campbell is to be thanked for presenting to us once more this important subject in such an interesting manner.

The subject is so large that I will confine my remarks to the fresh fractures. It is an important subject for many obvious reasons, chief among which are: (1) the frequency of the occurrence of these fractures; (2) the usual advanced age of the patient (I call this the grandmother fracture); and (3) the serious prognosis.

Good results range from 40 to 90 per cent as reported by various authors. The average in the nation runs just about as Dr. Campbell has given it today, from 50 to 55 per cent. This, I think, is the reason why so many today are attempting to better this percentage by instituting some form of open operation.

The old division between intracapsular and extracapsular fracture is not a bad one; it is practical. Extracapsular fractures as Dr. Campbell has pointed out, always unite, no matter what the treatment. Of course, even here there are exceptions. I remember a case of non-union of a peritrochanteric fracture.

In the intracapsular type we frequently have non-union, even when the abduction treatment is used. It is curious to note that Dr. Whitman, the author of this method, has never published his own end-results.

Dr. Campbell alluded to the element of circulation as possibly being the cause of good union, or its absence as one of the causes of non-union. There is another factor that might be considered (it has been brought up now and then for the past twenty-five years), and that is the presence of the synovial fluid. Why should a central fracture unite in only half the cases, and why should a fracture a short distance off, the so-called peritrochanteric, always unite? Then, again, we have fractures in other locations where the broken-off fragments are bathed in synovial fluid and that frequently do not unite. I refer to the head of the radius and to the navicular bone of the wrist. This is food for thought.

It is conceded by everyone that among the closed methods, the abduction treatment is the one to follow. The difference in percentage of union rose from thirty-five, as a result of the abduction method, to about fifty-five per cent. So we already, thanks to Dr. Whitman, have a 20 per cent increase in our percentage of success the country over.

Dr. Campbell is to be complimented on his excellent results, and I personally know that I am voicing the sentiment of the meeting when I say—thank you.

Dr. M. S. Henderson (Rochester): Dr. Campbell has brought us a real message today. I know of no one in this country who has treated the number of cases of fractures of the hip that Dr. Campbell has. Also, I know of no one who has followed his cases through to the end so that he really knows what has happened to them. I should like to say many things about this subject, but I am going to be brief and will present some slides to emphasize a few points.

(Slide) My first slide is from the films of a woman, sixty-eight years of age, who, while crossing the street, was struck by an automobile. She fell and sustained an intracapsular fracture of the necks of the femur, of the central type. Under anesthesia we reduced the fracture and put her up in the Whitman abduction position. That was in July. The next film was taken in November. I think you will agree that the union was complete. We allowed her up on crutches, and while walking along the corridor in the hospital, with a nurse beside her, she slipped; although partially supported by the nurse on one side and leaning against the wall on the other, she slid to the floor.

She sustained a fracture of the other hip, but as you will note, it is not a complete fracture but rather of the nature of a crushing inward of the neck just below the head. The head itself is intact. (Slide) We merely put her to bed, put a Thomas extension splint on for about five weeks, and at the end of six weeks had her using the limb. This particular type of fracture needs no reduction or prolonged fixation. In other words, this type of fracture will give a good result regardless of treatment.

This last slide shows the same case two and one-half years later. This woman was sixty-eight when she fractured her hip. She is over seventy now. She carries on her business as a saleslady, walking back and forth to work each day. The first fracture demanded careful and prolonged treatment. The second fracture as stated would have given good results regardless of the treatment given.

(Slide) A few years ago the American Orthopedic Association attempted to collect information concerning the end results in fractures of the hip and called on its members and others for data. This slide gives the end results of forty-two cases that we were able to trace definitely in the Mayo Clinic.

You will notice that the results in patients under sixty are much better than in those over sixty, and they coincide very closely with those of Dr. Campbell's. Although there are only forty-two cases, the end results are known. There was a mortality rate of 13.3 per cent in those under sixty and 14.8 per cent in those over sixty. The patients succumbed to incidental causes such as appendiceal abscess, pneumonia, pulmonary embolism, shock, and uremia. In other words, it is the complications that are prone to occur in people at this time of life that carry them off, and not the fracture itself.

Not counting the deaths, but considering only those patients who survived, we obtained bony union and excellent results in 76 per cent in those patients under sixty, but obtained good results in only 54 per cent in those over sixty.

I greatly enjoyed Dr. Campbell's paper.

Dr. W. C. Campbell (closing): In answer to Dr. Henderson, when I stated four weeks, I meant four weeks. I would like to explain that, if we see a fracture at the end of four weeks in which no reduction has occurred, the chances of union by any form of conservative treatment are so slight that we should treat it as an un-united fracture. We should operate on un-united fractures of the neck of the femur early by employing the bone peg graft. In most of the fractures not examined until the end of four weeks there is no apposition, and the fragments are far apart. However, a case was reported by Zadek in which two months had elapsed without treatment and union was secured by conservative measures, but in all probability such results are very rare. If union is to be secured, the proper treatment must be instituted soon after the occurrence of the fracture.

Trochanteric fractures are often confused with central fractures of the neck of the femur. After analyzing a large number of cases I have found that the average age is seventy-four in those above sixty, for trochanteric fractures, and seventy-two years for central fractures. So you can see that the trochanteric fracture is also a fracture of old age. That is one reason why confusion often arises as to end results.

The mortality in central fractures above the age of sixty is thirty-two per cent. The mortality below the age of sixty is nil. The mortality, taking them all together, runs about sixteen per cent in central fractures. The mortality in trochanteric fractures is twenty-two per cent above the age of sixty, and below the age of sixty there is no mortality at all. In trochanteric fractures this can be very materially reduced by the treatment I have just mentioned in the elderly, being able to remove casts and apparatus and getting them up, sitting up out of bed at a much earlier time.

I think we will find in subsequent statistics we will reduce the mortality in the elderly in that type of case.

DAVIS METHOD OF PROSTATIC RESECTION*

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My being selected to present the subject of prostatic resection before your distinguished society is an honor that is greatly appreciated and stimulates my greater interest in a subject which appears to be of lively interest to the medical profession at the present time.

Perhaps there is no operation that has done more to relieve the suffering male patient than prostatectomy. The stern necessity for removal of urinary obstruction has required surgical removal of the prostate gland in many men past middle age. In spite of the improvement in surgical technic, the marvelous improvement in preoperative preparation of patients, the special attention given to decompression through drainage, the improvement in the various laboratory methods for determining the proper time for operation, this operation, with its potentially high mortality and morbidity rate, has not fulfilled the ideal. The success of prostatectomy has been so generally accepted by the profession that, until recently, removal by a minor operation of only that portion of the gland causing obstruction has received indifferent attention, except from a few surgeons.

One has only to review the literature to observe the array of splendid devices and procedures which have been advocated for the relief of vesical orifice obstructions, which is sufficient testimony to the eagerness to substitute methods of simplicity for the former orthodox measures with their complications and dangers.

All operators are familiar with the marked shrinkage that regularly occurs in the enlarged prostate following the preliminary cystotomy drainage prior to the subsequent enucleation in the two-stage prostatectomy. Since the prostate diminishes in size with the removal of the residual urine through a cystotomy incision, the same shrinkage follows the adequate drainage instituted through removal of the tissue that is impinging upon the vesical orifice and posterior urethra. When this can be successfully accomplished through transurethral resection, the indications for more radical surgery vanish, for few men will submit to a prostatectomy when a minor procedure will permit them to void freely and completely empty their bladders.

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*From The Department of Prostatic Resection, Crowell Clinic of Urology and Dermatology, Charlotte, N. C. Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

Regardless of the type of obstruction or the operation that is to be performed, it is of paramount importance to properly prepare these patients by thorough decompression with a retained urethral catheter. A careful watch should be maintained of the nitrogenous constituents of the blood; the renal function should be stabilized and the correction of other constitutional abnormalities should receive appropriate consideration. It is only by adhering to these well known surgical principles that optimum results and a minimum mortality rate can be obtained.

The operation of resection is performed by means of suitable electric currents applied through special instruments within the urethra. There are several instruments that are now available for accomplishing this type of operation and the author has had ample opportunity to try his skill with the various instruments with special attention to the most promising.

The peculiarity of the individual operator and the skill that he has acquired as a cystoscopist with the various types of lens instruments will undoubtedly cause confusion in orientation within the urethra when he attempts to use a lens system with which he is not familiar. A correct interpretation of disease at the vesical outlet is essential before any transurethral operative procedures should be attempted.

Of the various instruments advocated for resection, I have no hesitancy in stating that, in my opinion, the Sterns resectoscope has no superior. This instrument is composed of a sheath 28 F. in size with a fenestrum ⅞ inch in length. The fenestrum is 3/5 of the diameter of the tube in depth and is closed by an obturator during introduction. The working parts consist of a direct vision telescope, a light carrier, a water conduit and the loop electrode. The loop electrode is operated by means of a rack and pinion mechanism and can be made to traverse the fenestrum as the operator desires. In operating, the tissue to be removed is engaged within the fenestrum and the loop will be observed resting upon the tissue prior to its removal, and the action of the current is in full view at the beginning of the section. A slight pressure on the sheath holds the tissue firmly within the fenestrum and there is no tendency for the entire instrument to creep, with the possibility of removing tissue from an area that is not predetermined. The loop removes only tissue that protrudes within the fenestrum. The forward thrust of the loop carries the sectioned tissue into the tip of the sheath, permitting perfect visualization of the entire gutter from which the section was removed. The section of tissue adheres to the loop and is withdrawn with the working parts after each section. It is never necessary to search within the bladder or to depend on irrigation to flush the sections from the bladder through the sheath, a procedure that may prolong the operation where a large number of sections are to be removed.

The new McCarthy electrotome is an excellent instrument with almost perfect visualization. The loop is placed beyond the protruding tissue and the sectioning is towards the lens system. The sectioned tissue remains within the gutter formed and has to be removed from its bed with the loop or flushed from the bladder. The location of individual bleeding vessels at its source is more readily accomplished with this instrument.

From the earliest reports of transurethral correction of vesical orifice obstructions, the occurrence of hemorrhage has been the chief difficulty, restricting, formerly, such procedures to the smaller obstructions. With the application of suitable electric currents, hemostasis can be rapidly and permanently attained. From my initial experiments with resection, it was realized that the sectioning of tissue and the control of hemorrhage could not be rapidly and permanently accomplished with the same type of current. After numerous experiments with every type of generator that has been developed, I am more than ever convinced that my initial conception was correct.

I am of the opinion that excessive coagulation is to be avoided to prevent sloughing and secondary hemorrhage. I also insist that, in order to obtain effective hemostasis, the tissue must be coagulated sufficiently to permanently seal the bleeding vessels, to prevent their opening during manipulation or after a lapse of several hours. Subsequent uncontrollable hemorrhage would necessitate additional measures and in some instances, cystotomy. Even fatal hemorrhage has occurred in the experience of several operators. Hemostasis, when properly established, should and will be permanent.

The character of the different high frequency surgical currents employed varies immensely and different types of current produce radically different results. For your clearer conception, I will describe, briefly, the characteristics of the more important with which we have to deal. Generally speaking, there are two types of high frequency currents—damped and undamped. An undamped current is one which oscillates in the direction of flow and has a substantially uniform rate of amplitude, with practically continuous application of energy. This type of current is usually generated by means of a vacuum tube, has excellent cutting qualities but a very thin depth of coagulation.

A damped current is one which varies periodically in rate as well as amplitude and flows with recurrent bursts of energy or electrical discharges of considerable intensity but of short duration, with dead or inactive periods between wave trains. This current has excellent coagulating but no cutting qualities.

A moderately damped current, when applied through the proper electrodes, has the characteristic of severing tissue as readily as the sharpest scalpel, while the intense heat generated at the point of contact dehydrates the severed edges of tissue, thus sealing off the capillaries, lymphatics and smaller blood vessels. To seal the larger vessels permanently, a highly damped current is most efficient.

In all types of vacuum tube generators, by reducing the plate voltage, the current output will slowly coagulate tissue if applied for a sufficient length of time, but this coagulation is superficial and hemorrhage may occur from manipulation of instruments or, in many instances, after the patient has been returned to bed. The ideal hemostatic agent during resection is a highly damped current with the loop in contact with tissues. An exposure of about one second will coagulate to a sufficient depth so that the hemorrhage is permanently controlled.

The Davis-Bovie Electro-Surgical Unit is constructed in two entirely separate sections within one cabinet. The cutting section produces a moderately damped current, which has been found to section tissue with the least amount of hemorrhage. The other, or coagulating section, supplies a highly damped current which has no cutting qualities and is, therefore, ideal for the coagulation necessary for rapid hemostasis. Each section is an entirely separate electrical circuit with individual controls and adjustments. An electro-magnetic selector is provided, which instantly connects either to a common outlet through the operation of the proper treadle of the double foot switch.

The perfection of the instruments and application of suitable currents permits the removal of sufficient tissue with adequate hemostasis under vision, permitting the correction of many obstructions that were formerly considered amenable only to complete enucleation of the gland. The fundamental principle in this problem is the removal of the obstructing tissue, either by excision or destruction, or by a combination of these, sufficient to relieve the obstruction with a minimum of injury to the surrounding parts. Equally important is the restriction of complications and the adequate control of hemorrhage. With the present equipment, it is possible to relieve more than 90 per cent of the cases with an operation that is simple, wherein the risk is negligible and the final results are equal, if not superior, to those obtained by prostectomy.

The amount of tissue that should be removed will vary with the type and amount of obstruction. The experience gained from a few of my earlier cases demonstrated that to insure a permanent result it is necessary to do more than a mere canalization of the prostatic obstruction. This procedure will cure cases with bars and contracture, but in the larger obstructions at least two-thirds of the obstructing gland should be removed. Where this has been accomplished, the results have been permanent.

In my series of cases the residual urine has varied from nothing to forty-eight ounces with complete retention. The amount of residual is not a criterion of the amount of obstruction present. In some patients without residual, large bilateral adenofibromatous hypertrophy was found; in others, with complete retention, only a small bar or median lobe was found to be causing the obstruction.

TYPES OF CASES RESECTED

Contracted vesical orifice		22
Median lobe or bar		102
Unilateral lobe		8
Unilateral and median lobes		39
Bilateral lobes		62
Bilateral and median lobes		74
Carcinoma		43
Following previous prostatectomy:		
Perineal	10	
Suprapubic	14	
	24	24
Total		374

Last year, 158 obstruction patients were operated upon by resection, while only twelve underwent prostatectomy. During the present year forty-six have been resection cases and only two have been cases of prostatectomy.

Twenty-four of the patients reported in this series had been subjected to a prostatectomy within the past five years prior to their admission for resection, when a recurrence of the obstruction was found.

Fifteen patients have required a second operation within six months as sufficient tissue was not removed to insure a permanent result. Eleven of these patients were among my earlier resections with an equipment that was far inferior to that in use at the present time. Four of them, however, were during the past year. The anesthetic in these four cases was of short duration and unusual difficulty was experienced in controlling hemorrhage. Although canalization was accomplished, the results were not satisfactory and a second operation was necessary. The experience gained in these cases demonstrated that canalization will not insure permanent results.

Hemorrhage.—One of the chief difficulties in transurethral operations has been the proper control of hemorrhage. The current supplied by the Davis-Bovie unit reduces hemorrhage without excessive coagulation during each sectioning of tissue. The highly damped current supplied by this unit is superior to other types of current in the control of bleeding vessels not controlled by the cutting current. I recently experienced unusual difficulty in two cases in the control of hemorrhage. In one of these there was a carcinoma. The application of the coagulating current would control the hemorrhage temporarily but it would recur in a few seconds. Excessive coagulation was necessary for permanent control. The subsequent course of the patient demonstrated that no damage resulted from the coagulation. In the other case there was a small bilateral prostatic hypertrophy. During the operation there was a sudden rise in blood pressure from 180 to 240 systolic. Application of the coagulating current resulted in identically the same experience as outlined above. No untoward symptom has resulted from the excessive coagulation employed.

One patient required cystotomy for the control of hemorrhage. A carcinoma that involved the left lateral wall of the bladder was resected and it was found that the bleeding vessel was in such a position that it could not be reached with any instrument at hand. At operation it was found to be in a villous process about two inches from the operative site, which was clean and free from hemorrhage.

Two instances of postoperative hemorrhage have occurred, one on the tenth and the other on the fourteenth day. In both of these cases bleeding was easily controlled by evacuating the clots and coagulating the bleeding vessels per urethram. The ease with which clots may be evacuated with the author's cystoscopic curet and the vessel controlled leads me to regard secondary hemorrhage of minor importance.

Infection.—As the lymph channels and blood vessels are sealed by the current, post-operative infection has been of negligible frequency. The temperature elevation has varied from normal to 104 F. Approximately 16 per cent of the patients have had an elevation above 99 F. The temperature has not persisted longer than one week except in two cases in which it was elevated for a period of ten days. A chill preceded the fever in eighteen cases. The temperature elevation has been lower as a rule in those cases that have had prolonged preliminary drainage with a retention catheter and have developed an immunity to instrumentation. Eight cases of epididymitis have developed, all subsiding without interference. There has not been any case with symptoms that have led us to believe that a pyelitis or other kidney infection has resulted following the operation, although in a number of cases the edge of the section has been within one quarter of an inch of the ureteral orifice on one or both sides.

Carcinoma.—Forty-two of the patients in the series had carcinoma. Four have died of carcinomatosis without recurrence of the obstruction. One of these lived three years and nine months after the operation. Two had a recurrence of the growth within the urethra, that caused bleeding before micturition and required additional treatment. One patient, thought at the first operation to have had an adenoma, required a second operation in which the tissue showed the presence of adenocarcinoma. As shown by a questionnaire five months ago all others are living and free from obstruction.

Incontinence.—There has not been a case of incontinence following the operation in the benign obstructions. A temporary incontinence has been observed in three patients with carcinoma. Why these occurred I am unable to explain. These patients had radium element inserted through the perineum. In two of these patients the incontinence was of four and six weeks duration. In the third it has persisted for three weeks and I presume that it will subside as have the other two after a lapse of sufficient time.

Potency.—A remarkable feature following resection is the rejuvenation of the sexual activity of these patients. All except two report that their libido has been markedly improved and many claim that they are as potent as they were twenty or more years before. One must regard this feature with conservatism as the natural tendency for the male is to exaggerate his sexual ability.

Hospitalization.—The average stay in the hospital after the operation has been four days. Eight patients have remained two weeks, twenty-seven one week, while all others have been dismissed within three to five days.

Mortality.—There has not been a death immediately following resection. Three patients have died within four weeks following the operation. The first patient had a very severe cardiac condition and the resectoscope was used only to control hemorrhage that was caused by the examining cystoscopy. He was dismissed from the hospital in three days and died a cardiac death three weeks later. I do not think that the instrumentation hastened his demise. The second, a patient with coronary sclerosis, was dismissed from the hospital in four days after the operation, was up and about feeling fine, without urinary symptoms, when he suddenly died in an attack of angina pectoris two weeks after the operation. A third patient was dismissed from the hospital in good condition. While at his distant home a slough from the coagulated site caused complete retention and at his return to the hospital he showed an hemorrhagic nephritis which eventuated in a uremic death three days later and three and one-half weeks after the operation. I accept these as my postoperative mortality—which is less than one per cent.

Postoperative Residual Urine.—The majority of patients completely empty their bladders following the operation. There has not been a residual of over two ounces at the time of primary dismissal. Upon a return for a recheck examination this residual has been reduced to less than one ounce in every case except in the cases reported that required addition measures to insure adequate drainage. After sufficient time has elapsed, shrinkage of the remaining gland has been noted and the residual has disappeared.

Recurrence.—I will report the number of patients operated upon in yearly groups prior to discussing the question of recurrence.

Year	Number
1927	26
1928	36
1929	42
1930	66
1931	158
1932	46
Total	374

You will note that 170 of the cases were operated upon prior to 1931, 158 during 1931 and the balance during the present year. Of the 170 cases, eleven had to have a second operation within six months as outlined above. Of the 158 cases operated during the past year, four had a second operation within six months. One patient was operated upon in 1929 and a grade 2+ median lobe removed. The lateral lobes at this time were not enlarged. He returned in 1931 with complete retention due to a large bilateral lobe, which was resected. A patient was operated upon in 1930, and the tissue reported adenoma. He returned this year with obstruction and was again resected and the tissue report was adenocarcinoma. Two patients with carcinoma operated upon in 1931 returned with a recurrence of carcinoma within the urethra, with symptoms of blood in the first urine, and resection was again performed to remove small papillomatous growths from the urethra.

The majority of the glands operated upon during 1927 and 1928 were of the smaller obstructive type; a goodly number, however, were typical adenomatous hypertrophy. It is gratifying that although we did not remove as much tissue at that time as we would in a similar case today the results have been satisfactory and they are free from obstruction.

During the years 1929, 1930, 1931 and 1932 approximately 25 per cent of the cases have been of the larger types of hypertrophy. While these cases have only been operated upon for three years or less the results have been good.

I do not know what the percentage of recurrence in all of these cases will be over a five or ten year period. Time alone can tell. It is probable that we will have a higher percentage of recurrence than the results in my earlier cases would indicate. Considering the experience of Caulk in a large number of cases over a ten year period and of the few cases of my own that have extended over four or five years, I am inclined to believe that the incidence of recurrence will be small.

THE RESULTS OF RESECTION OF THE PROSTATE GLAND*

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THE sacrifice of the patient's prostate gland as a ransom for the freedom to urinate during his declining years has been accepted until recently almost without question by him and by his physician. If this sacrifice could be made with a risk no higher than that incurred in the surgical treatment of other benign lesions it would be justified, provided the functional results were reasonably good. When it is realized that the mortality from prostatectomy skillfully performed is double that from operations generally, and that the functional results will in many cases be disappointing, it seems pertinent to recall the significant fact that only a small portion of any hypertrophied gland causes obstruction, and that the prostatic tissue adjacent to the urethra, if it does not encroach on its lumen, is not of importance and need not be considered in relieving the obstruction as its hypertrophy into the rectum or bladder is of no more detriment to its possessor than that of any other signs of advancing age.

When one remembers that the diameter of the urethra is less than 1 cm. and the normal distance from the verumontanum to the neck of the bladder is less than 2 cm., it readily becomes apparent how little such tissue is needed completely to obstruct the urethra, and how really insignificant an amount can partially obstruct it. To cite an analogy, let the bladder be considered a flask and the urethra its neck. A stopper that will completely close the outlet is comparatively small and that which will partially obstruct it is still smaller.

To remove this obstructing tissue without removing the remainder of the hypertrophic gland requires an instrument which will meet three major requirements: (1) it must remove all the obstructing tissue at the time of operation, since to remove only a portion in the presence of residual urine will aggravate, not improve, the symptoms from which the patient is suffering; (2) the operation must be carried on under adequate vision so that the obstructing portions of the gland may be seen and their relationship to other structures determined before their excision, and (3) the procedure must be such as to insure adequate control of bleeding either during or immediately following the excision.

Braasch, in 1918, developed an instrument called a median bar excisor which permitted the operator for the first time to remove obstructing cicatricial tissue from the neck of the bladder under full vision. The instrument was adequate for the relief of this type of obstruction, but as it did not provide for the control of bleeding it was not applicable for the relief of obstruction that resulted from adenomatous hypertrophy of the prostate gland. I believed that this type of obstruction could, in certain cases, be treated in a similar manner, and I therefore, modified Braasch's instrument so that larger amounts of tissue could be removed; the bleeding was controlled by electrocoagulation of the cut vessels. The first operation was performed in the spring of 1926, and in the last six years I have used the instrument in more than 300 cases.

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*From the Section on Urology, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, St. Paul, May 23 to 25, 1932.

As the instrument is now employed it consists of four parts: first, a direct Braasch cystoscope of diameter number 28 French with a fenestra near its distal end. Second, a cylindric sheath for closing this opening; this sheath carries a guide for holding a flexible electrode. Third, a multiple needle electrode in which the needles are arranged in a semicircle similar in size to the circumference of the tubular knife. Fourth, a tubular knife.

After the instrument is in place and the obturator withdrawn, the bladder is filled with fluid and the cylindric sheath inserted. By closing the fenestra the instrument is converted into a direct cystoscope and it is possible for the operator to examine the neck of the bladder before commencing the operation. When the portions of the hypertrophied lobes causing the obstruction are found, the sheath closing the fenestra is withdrawn and as much of the obstructing portion of the gland as possible is forced into the opening. This is done under vision, as the proximal end of the instrument is open and the fenestra can be made to grasp any portion of the gland desired. The sheath that covers the fenestra is not necessary for adequate vision but simply makes the movements of the instrument easier as it prevents projecting parts of the prostate gland from projecting into the lumen of the instrument.

When the tissue to be excised is firmly engaged, the multiple needle electrode is passed through the lumen and thrust into the projecting tissue. These needles are so placed that they form a semicircle in the exact situation the tubular knife will cut. A high frequency current is then run through them, thus rendering the tissue to be cut by the knife ischemic by electrocoagulation. The coagulation is never prolonged sufficiently completely to coagulate the removed tissue as with the Day and Kirwin instruments, but simply long enough to coagulate the course the tubular knife is to follow. When the coagulation is considered complete, usually after the lapse of ten to fifteen seconds, the needles are removed and the tubular knife is thrust through the projecting tissue. The excised portion is removed from the lumen of the knife on its withdrawal.

This procedure is repeated as often as necessary to remove whatever tissue is obstructing the urethra. If, as usually happens, there are some vessels whose bleeding has not been controlled by the needle electrode, the instrument is again converted into a direct cystoscope while still in place, and through the catheter guide, which is incorporated in the cylindric sheath, an electrode is passed and the bleeding points electrocoagulated individually under vision. This manipulative procedure is no more difficult than passing a catheter into a ureteral orifice, and is done in much the same way.

As Caulk has pointed out there is considerable clinical evidence to show that once residual urine occurs as a result of urethral obstruction from hypertrophy of the prostate gland the presence of this urine stimulates hypertrophy, the increased hypertrophy in turn causes more retention and a vicious circle is established. Whether this is true remains to be proved, but all urologists, and probably most observant physicians have noted that following suprapubic drainage of a bladder distended by obstruction of an enlarged prostate gland, the gland invariably diminishes in size. For this reason in cases of increased risk a two-stage prostatectomy has frequently been employed. If removal of residual urine by suprapubic drainage results in shrinkage of the prostate gland, it seems self-evident that residual urine will be relieved by the removal of the obstruction from the urethra, and the same shrinkage in the size of the gland will occur. This observation is important in this form of treatment for, although the amount of residual urine present is not an indication for or against transurethral relief of the obstruction, it is a positive indication of the success or failure of the procedure after the operation has been performed.

Between January 1, 1925, and January 1, 1932, I performed some form of transurethral resection in 250 cases for the relief of enlargement of the prostate gland which had produced ureteral obstruction. At dismissal 171 of the patients were catheterized to determine the presence or absence of residual urine. None was found in 120 cases, in twenty-nine less than 30 c.c. was found, and in twenty-two some was present.

There is no record of catheterization in seventy-nine cases, presumably because the patients were free from symptoms. Before transurethral resection there was more than 150 c.c. of residual urine in each of 105 cases, and in forty-six (20 per cent) of these it varied from 300 c.c. to complete retention.

The position of the hypertrophied tissue rather than the amount of residual urine, indicates the advisability of employing resection for its relief. As I have stated the amount of residual urine is not one of the criteria for or against adopting resection, but it is the best method of measuring its success. Frequently on removal of the catheter from 30 to 100 c.c. retention may be noted for a few days until the edema incident to the operation has subsided. If more than this is present the operator has probably failed to remove sufficient tissue. Such patients are fortunate if they escape a stormy convalescence which usually may be followed by subsequent resection. It is the complete relief of obstruction with its resulting residual urine that makes this procedure so well tolerated and so rarely followed by serious afebrile reactions.

If sufficient tissue is not removed completely to relieve the obstruction, shrinkage of the gland does not occur and failures will result. Therefore, it seems advisable to remove only sufficient tissue to give an adequate channel from the bladder through the prostate gland so that at the completion of the operation one should be able with the instrument at the verumontanum to look directly into the bladder at the level of the trigone. To construct such a channel requires usually the removal of only 5 to 10 gm. of tissue, although in a few cases in which hypertrophy is greater, more tissue may have to be resected. Efforts to remove the greater portion of the gland seem to defeat the purpose of the operation, and are contra-indicated, for a new and adequate passage through the gland is what is required. It is seldom that the removal of more than 20 gm. of tissue is required to accomplish this, and usually the removal of less than 10 gm. results in complete emptying of the bladder. If two-fifths of the hypertrophy of an enlarged gland represents its obstructing part and 20 gm. is arbitrarily taken as the maximal amount of tissue easily resectable through the urethra, then all hypertrophied glands weighing 50 gm. or less, should be suitable for transurethral resection.

In the last three years at The Mayo Clinic, 575 cases of benign hypertrophy of the prostate gland were treated suprapubically. In only 32 per cent did the removed tissue weigh more than 50 gm., indicating the large field of application for transurethral relief of obstruction.

Since January 1, 1925, I have treated more than 300 cases of obstruction of the neck of the bladder by various methods of transurethral resection of the obstructing tissue. This does not include those so-called cases of contracted neck of the bladder which are best treated by sphincterotomy with the Collings electrode. So far, I have never found it necessary to remove more than 25 gm. of tissue, and relief of obstruction is obtained in most cases by the resection of from 5 to 10 gm. Operation was performed on 186 patients with the instrument I have described prior to January 1, 1932. In seventy-four cases the removed tissue was predominantly adenofibromatous, and in ninety-four inflammatory changes were more marked. Malignancy was found in sixteen cases and tuberculosis in two. Four patients died in the hospital, one patient, aged seventy-three years, had extensive carcinoma and embolic pneumonia developed. Two patients, aged sixty-five and seventy-eight years, respectively, died fifty-nine and thirty-three days after operation from sepsis, the indirect result of the procedure. The fourth patient also died from sepsis, which occurred on the seventh day after operation. I doubt if mortality can be avoided from transurethral operations when patients are aged more than seventy years.

If all obstruction is removed and residual urine does not persist, a considerable area of denuded tissue may be expected to heal rapidly, but it must not be overlooked that bleeding is controlled in this operation by electrocoagulation, which causes destruction of tissue. This has to be absorbed or slough away, and if residual urine is not completely removed conditions are ideal for the development of secondary infection. It is, therefore, most important to reduce to a minimum the amount of tissue destroyed by electrocoagulation, and for this reason I prefer to use it only for the control of bleeding, and to depend on the knife rather than the high frequency current for the excision of tissue.

In five of the 186 cases, prostatectomy was necessary subsequently. In four cases the operation was done within the year, and was obviously due to failure to remove sufficient tissue at the first operation. In the other case, one of adenofibromatous hypertrophy, prostatectomy was done four years after the original resection and was evidently due to continuation of the hypertrophy. As operation in this series of cases was done over a period of six years, subsequent prostatectomy because of continued hypertrophy of the prostate gland would seem to be the exception that proved the rule that residual urine is a stimulation to prostatic hypertrophy, and that with its removal hypertrophy does not progress.

Of the 168 patients with benign and inflammatory obstruction treated during the last six years, three died in the hospital, 148 have been traced by letter and subsequent visits. Of these, 114 express themselves as being satisfied with the procedure, whereas thirty-four still have urinary symptoms that they felt should have been relieved.

The low mortality associated with this form of relief from prostatic obstruction is not its only recommendation. Quite as important is the short postoperative convalescence, usually free from any distressing complications; the majority of patients (100 of the 168) left the hospital within ten days. The saving in hospital care in such cases at the University Hospital in Iowa has been estimated at $45,000 a year. When one remembers that the dressings following operation on the prostate gland cost more than for any operation except colostomy, and that the average stay in hospital is estimated at six weeks with one or two special nurses during a part of this period, this estimate does not seem too great.

A procedure that involves less risk and gives final results equal to those obtained by a major surgical procedure, besides reducing hospital expense and permitting the patient to meet his financial obligations to the profession, deserves careful consideration.

A QUANTITATIVE STUDY OF VIBRATION SENSE IN NORMAL AND PERNICIOUS ANEMIA CASES*

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No truly quantitative method for the determination of threshold values of human vibration sensation has so far been satisfactorily developed. The value of the usual clinical method of determining vibration sense is restricted. It can show total or marked loss of vibration sense well for a given fork, but provides no satisfactory measure of relative amounts of loss. The present work was undertaken to develop a more precise method of testing and evaluating the vibration sense threshold.

LITERATURE

Rumpf[1] was the first to study vibration sense quantitatively. He used successive stimuli obtained from faradic current of thirty-two interruptions per second. He also tried a four-sided ruler of wood, provided with varying interruptions along its edges; the sensation of a rough body was produced by drawing this ruler across the skin at a fixed rate of speed and with even pressure. Rumpf finally used a set of fourteen tuning forks whose vibration rates were from 13 to 1,000 per second. Over many points of the body, both bony prominences and muscular parts, he determined the fork whose vibrations could just be perceived. He thought that an anesthetic zone might be outlined by means of a tuning fork.

Treitel[2] used a C128 fork fifteen centimeters in length, with displaceable weights on its prongs and with a foot plate of horn to avoid temperature disturbances. He recorded the seconds during which the vibrations of the fork were appreciated at different points, and in some instances also the length of time the fork could be heard. He noted that vibrations might be felt after the fork had been stopped, much as tones are heard for a period of time after a sounding instrument is removed from the range of hearing.

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*From the Division of Nervous and Mental Diseases, University of Minnesota Medical School. Contracted for publication from a thesis presented to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the Degree of Doctor of Philosophy.

Egger[3] wrote rather extensively upon "Osseous Sensibility." He used tuning forks of 128, 512 and 2,048 vibrations per second. The vibrations of the latter fork were imperceptible for a normal individual, and the fork of 128 vibrations per second furnished the most powerful vibratory stimuli. Bing[9] states that Egger used a fork of 128 vibrations per second, weighing about 500 grams and having a foot piece six millimeters in diameter. Egger noted that vibration sensation diminished in intensity with age, though even at the most advanced ages it was never entirely absent. Dweitschenko[4] observed that a healthy individual always clearly perceived the sensation arising from a vibrating tuning fork when placed over a bone. The perception of a younger person was better than that of an older one. A thick layer of soft parts overlying bone greatly reduced vibratory sensibility.

Rydel and Seiffer[5] tested vibration sensation, which they termed "pallæsthesia," by placing the tuning fork on symmetrical parts of the body and comparing the two sides. In order to regulate time elements, they adopted the Gradenigo triangle.

In 1899 Gradenigo[6] presented a method whereby auditory acuity could be tested with a greater degree of accuracy than had previously been the case. He said that if a tall triangle were painted on the end of a prong of a tuning fork which was capable of vibrating with a sufficient amplitude, this figure would appear more or less doubled when the fork was in vibration. The duplicate images of the triangle would overlap, the overlapping portion becoming very distinct in outline and color, and the outer portions appearing more pale and less distinct. Then as the vibrations of the fork decreased in amplitude, the field of overlap would become greater in size. The increase in size of this overlap triangle would thus correspond to the diminution of amplitude of the vibration and would, therefore, become a measure of the amplitude. By putting black lines on a white background at right angles to the perpendicular of the triangle there was obtained an index of the amplitude of vibration at any instant of the tuning fork's decrement.

The Gradenigo triangle which Rydel and Seiffer attached to their fork was marked off into eight such calibration units. The fork was of sixty-four vibrations per second, 100 grams weight, twenty-three centimeters length and had a plate of horn on its base to avoid temperature differences. Their observations were subject to inaccuracies arising from estimating severely reduced vibration sense thresholds. If the patient still felt the vibrations when the number upon the Gradenigo triangle was eight, that is, when the black triangle was back at rest, they called it nine, and if the patient received the vibratory sensation for a very long time after the fork was at apparent rest, they estimated the reading to be ten. As their readings over the skull and over the deltoid muscle were commonly seven, they thought that Egger was inaccurate in stating that vibratory appreciation was dependent upon overlying muscle.

Knapp[7] tested bony sensibility with forks of varying pitch, using a set of five or six C forks ranging from thirty-two to 2,048 vibrations per second. He thought that factors such as thickness of soft parts overlying bones being equal, there is no variation in sensitiveness between different bones as there is between different areas of the skin. He said that normally 512 vibrations per second is the greatest vibratory rate perceptible. He obtained a relative idea of the bony sensibility by comparing corresponding regions of the body.

Minor[8] used a tuning fork corresponding in all respects with that of Rydel and Seiffer, though he determined the length of time in seconds during which the vibrations were felt. He observed that in fractures, vibratory sensation in both the peripheral and proximal fragments was preserved. He stated that a continuously vibrating apparatus, electro-magnetically driven, should be used to test vibration sensibility accurately.

Bing[9] also used a fork equipped with a Gradenigo triangle. He tested various areas of the body and then retested those same areas after they had been anesthetized with carbon dioxide snow for thirty seconds, with adrenalin and cocaine infiltration or with ethylchloride freezing. In the anesthetized areas vibratory sensation rarely was appreciably reduced. He felt that the anesthetic probably caused an increased consistency of the tissues and the vibrations were, therefore, better transmitted to the bone beneath. Forli and Barrovecchio[10] likewise used a fork with a Gradenigo triangle. Like Rydel and Seiffer, they expressed vibration sense thresholds in units read from the triangle. The majority of their readings were above eight and therefore not very precise.

Neutra[11] differentiated osteoacusis from vibration sense, using forks of 100 to 200 vibrations per second. He thought that one heard the vibrations conducted to the inner ear through the bone, and also through the denser connective tissue and cartilage. Dejerine[12] attempted to exclude osteoacusis by using a tuning fork having not over twenty double vibrations per second; this fork will not produce sound perceptible to the human ear. Neutra determined vibration sensibility in its "fatigue time." The technic is reviewed by Lewandowsky.[13] Neutra would place a vibrating fork upon a given point A, and when that fork was no longer felt at A, he would transfer it to a similar point B. The time which elapsed between the disappearance of the sensation at A and its disappearance at B he termed the "fatigue time." If the sensation was equal on the two homologous parts of the body there would necessarily exist a constant relation between A and B, that is, A to B would equal B to A. If, on the other hand, there was a disturbance of vibratory sensibility, no such correspondence between the two parts of the body would exist.

Sterling,[14] using the Rydel and Seiffer type of fork equipped with a Gradenigo triangle, checked their work and said that their quantitative estimations were much too high. He thought that the transference of vibration from the tuning fork into the body depended upon two physical laws. First, the intensity of vibration increases with the density of the vibrating body; therefore, the material of which a given fork is made is of considerable importance. Secondly, the greater the identity between the vibrating body and the part which carries the vibration, the greater becomes the conduction of the vibration; hence, a tuning fork will conduct the vibration very well through bone but quite poorly through skin and muscle.

Williamson[15] concluded that normally vibrations are always felt over the styloid process of the ulna, inner surface of the tibia, both malleoli, anterior superior iliac spine, the nails of the fingers and big toes, and over the abdominal wall, provided the vibrating fork is firmly in contact with the wall.

Head,[16] using a C128 tuning fork, measured vibration sense quantitatively much like Neutra did. Head's technic was more exact in that he measured the "fatigue time" with a stop watch.

Symns[17] made the first really quantitative estimation of vibration sensation. He used a specially constructed tuning fork with a frequency of 108.75 vibrations per second. Two pieces of steel were attached to the upper portion of the fork, arranged in such a manner that when the arms of the fork were vibrating, a small window was seen between them. This window disappeared when the vibrations of the fork reached a definite amplitude. The moment that the window disappeared the fork was applied to a subcutaneous bony point, and a stop watch started. The individual being tested signaled at the instant he ceased to appreciate the vibration. The watch was then stopped and the time recorded. Symns tested vibratory sensibility over both malleoli, tibia, anterior superior iliac spine, sacrum, sternum, radius and ulna. He tested a series of normal individuals and constructed the mean normal curve of their vibratory sensibility. Experimentally, when the skin was anesthetized, twenty per cent of the vibratory sensation was lost. The remaining eighty per cent of the sensation, he concluded, followed the paths of deep sensibility.

Wood,[18] using the Symns technic, obtained threshold readings varying considerably from those of Symns. He thought this variance was due to some difference in weight and temper of the shaft of their respective forks. He, like Symns, found in tabes a decided decrease in vibratory acuity over the sacrum; he termed this decrease the "sacral dip."

Piercy[19] used the same technic and his observations agree well with those of Wood. He noted that vibration perception in pernicious anemia was reduced. Six patients over sixty-five years old had total absence of vibration sense over the sacrum. He said this might be due to sclerosis of the nutrient arteries of the posterior roots and posterior columns of the cord with secondary degeneration of the nerve fibers.

Ahrens[20] also used the Symns' method of testing. He said of the vibratory threshold that it was difficult to determine exactly when a stage of very slight sensation merged into a stage of absence. He, like Symns and Wood, noted that vibratory acuity over the sacrum is decreased in tabes. He also observed that the majority of persons showed an increased sensation in the upper extremities as compared with the lower, and that commonly the sensation was felt longer on one side of the body than on the other. Seventeen pernicious anemia patients were tested; those with subacute combined degeneration had early a marked decrease in vibratory sensation over the lower extremities, anterior superior iliac spine and sacrum.

Epstein[21] said constant initial amplitude of vibration could be obtained by striking the tuning fork so the prongs would click audibly. Duration of perception was computed in seconds from the click of the prongs. Given points were compared with their opposite homologs.

Pearson[22] studied the effect of age on vibratory sensibility. He used an ordinary tuning fork having 128 vibrations per second, a length of 16.5 centimeters and a base 4 by 5 millimeters square. The technic was to strike the fork, apply it to the patient and have him designate the instant it stopped vibrating. The length of time vibrations were felt was measured with a stop watch. He found in all cases tested a progressive age decrease in vibration sense over the lower extremities; the decrease was marked after the age of fifty. He said decreased vibratory acuity results from diminished blood supply to Goll's column due to spinal arteriosclerosis.

McKinley[23] devised a fork which could be rested with a constant pressure on the point to be tested. Small metal rods, of known lengths, were placed between the prongs of the fork. Quick withdrawal of a rod will cause an initial vibration of the prongs corresponding closely to the spread produced by the rod. He observed that "the more forcibly the fork is started, the more rapidly it runs down at first, whereas it will continue to vibrate at a relatively small amplitude for a rather long period of time."

It is evident, therefore, that in the usual clinical methods of testing vibration sense, the patient has too short a time in which to feel the higher amplitudes. A fork whose amplitude of vibration may be kept constant is necessary for quantitative estimation of vibration sense. Following the suggestion of McKinley the apparatus described in this paper was constructed in 1928; subsequent time has been devoted to its utilization.

THE APPARATUS

The apparatus consists essentially of a tuning fork with a rate of 120 double vibrations per second, the vibrations being sustained at any desired amplitude by a magnetic flux set up in a coil secured in position between the prongs of the fork. The coil is energized by a sixty cycle alternating current. A suitable means of regulating this current to desired values is provided, as well as adequate metering equipment for quantitatively measuring this exciting current, and from it determining the amplitude.

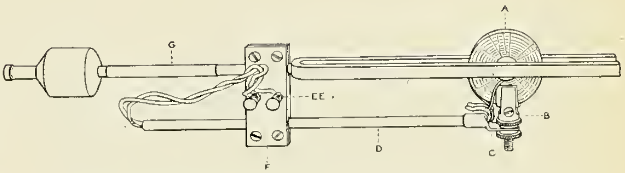

Fig. 1. Diagram of tuning fork used in this study.

The Tuning Fork.—The tuning fork illustrated in Figure 1 is 35.9 centimeters in length over all. It has a vibration rate of 120 per second; the rate was calibrated by the Waverly Musical Products Company of Long Island City, New York. The coil (A) is constructed of double cotton-covered enameled No. 20 copper wire, there being 121 turns of the wire in the coil. The coil is 4.33 centimeters in diameter and 0.80 centimeters in width; in its center is an iron core 1.38 centimeters in diameter. The distance between the prongs of the fork is 1.37 centimeters; this gives a clearance on each side of the coil of 0.285 centimeters and a possible maximum amplitude of vibration of 0.57 centimeters. The center of the core is placed 6.6 centimeters above the upper margin of the arch of the prongs of the fork and 12.0 centimeters below the tip of the fork, the distance from arch to tip being 18.6 centimeters and from arch to contact flange at the base of the fork being 17.3 centimeters.

The coil (A) is clamped into a slotted brass rod (B), which has a threaded shank. This shank, in turn, passes through a lug (C), which is soldered to the end of the supporting cylindrical brass tube (D), and is held in place by suitable lock nuts. The connections from the coil to the terminal posts (EE) are made of silk-covered No. 20 enameled wire and are conducted through this brass tube (D), which has an outside diameter of 0.6 centimeters. A quarter of a centimeter below the lower margin of the arch of the fork and at right angles to the shank of the fork is a slotted bakelite clamp (F) 6.0 centimeters long, 2.4 centimeters wide and 1.2 centimeters thick, through which extend the shank of the fork and the brass tube, the shank and tube being secured in place by two screws at each end of the clamp. There is a circular mark upon the brass tube and also upon the shank of the fork at the levels where they enter and leave the clamp. These marks serve as guides to insure the constant vertical position of the coil. The base of the fork is weighted so that the complete fork weighs 500.3 grams. About the shank of the fork below the clamp is a brass collar (G) through which the shank is freely movable so that the examiner may hold the fork in a vertical position allowing it to rest with a weight of close to 500 grams upon the particular point of the body to be tested. The circular contact flange of the base of the fork, which rests against the patient, is 1.0 centimeter in diameter.

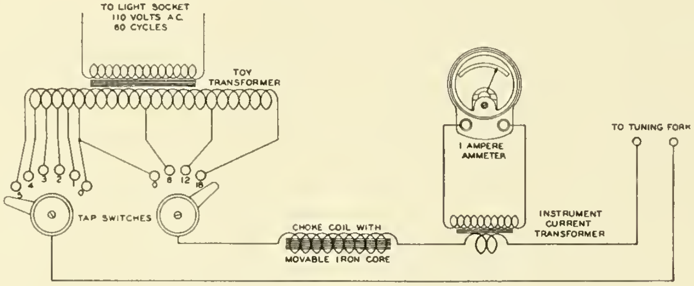

Fig. 2. Wiring diagram of apparatus.

From the terminal posts (EE) in the clamp (F) extend leads of silk-covered enameled No. 20 copper wire, of convenient length, to their points of connection to the current supply devices and the metering equipment which are contained in a carrying case provided for the apparatus.

Current Supply.—The fork was constructed to have 120 double vibrations per second in order that it might synchronize with the sixty cycle alternating current commonly found in the electric light supply systems of American cities. The current supply consists of a "Jefferson Midget Toy Transformer" of seventy-five watt capacity. The secondary winding of the transformer is so tapped that a voltage range from one to twenty-two volts is covered in one-volt steps by the use of two tap switches connected as shown in Figure 2. In order to make the voltage continuously variable to any desired degree between taps, an inductance coil with a movable laminated iron core is connected in series with the leads to the tuning fork.

Inductance Coil.—The inductance coil consists of 218 turns of No. 16 double cotton-covered wire wound on a fiber tube 1.6 centimeters in outside diameter. The movable core consists of a bundle of soft iron wire 13.5 centimeters in length, secured into brass end caps, and has a diameter such that it makes a snug sliding fit into the fiber tube on which the wire is wound. The coil is 12.30 centimeters in length and 2.72 centimeters in outside diameter. This inductance coil is mounted in the cover of the carrying case to remove its stray magnetic field as far as possible from the metering equipment.

Metering Equipment.—In order to determine what current metering equipment was necessary for use with the tuning fork, experiments were made on several normal persons to find the least value of amplitude which could be perceived. A one ampere ammeter was used for this purpose, and connected in series with the fork, from which it appeared that the minimum current value required would be approximately 0.4 amperes. A ten ampere ammeter was then connected in series with the fork and the maximum current which the apparatus could carry was found to be 8.0 amperes.

The scale of an alternating current ammeter ordinarily is not of uniform divisions but is divided in proportion to the square of the current, thereby affording the greatest accuracy of reading in the upper portion of the scale, where the intervals between scale divisions are larger. Since values from about 0.4 to 8.0 amperes were required to be read accurately, it became necessary either to use three separate ammeters to cover the range sufficiently, or to use one ammeter with some suitable multiplier. The Weston one ampere ammeter, model No. 528, and Weston current transformer, model No. 539, satisfied these requirements.

The current transformer has on its top a ratio adjusting switch which gives current ratios of 2:1, 5:1, 10:1, or 20:1 between primary and secondary where the secondary current is always one ampere for a full scale deflection of the meter. Thus the lowest values can be easily read with the 2:1 ratio and the highest with the 10:1, all on a single one ampere ammeter.

The apparatus has been assembled into a carrying case as shown in Figure 3, the case having outside dimensions of 40.0 by 22.0 by 22.4 centimeters, and a total weight of 7.28 kilograms.

Calibration.—It was necessary to measure the amplitude of vibration of the fork as a function of current in the coil, from which a calibration curve could be drawn, and also to determine the mathematical relation existing between the two variables.

Measurement of the Amplitude.—The fork was made secure in a horizontal position. The amplitude of vibration was observed through a microscope having an eyepiece micrometer. A beam of light from an arc lamp was concentrated through a condensing lens upon a tiny sharp mark scratched on the tip of the tuning fork prong. The position of the edge of the mark was noted against the eyepiece scale in the microscope when the fork was at rest. Then when the fork was set into vibration the mark appeared to spread out and form a brilliant line (*mn*, Fig. 4), the length of which was easily measurable in the microscope. It was noted, by means of an Eastman timing clock, that twenty seconds were required for the line *mn* to become stabilized.

In order to obtain the greatest possible magnification of this apparent amplitude of vibration of the fork, and yet keep the position of *n* within the scale of the micrometer in the eyepiece so that the amplitude might be read, it was found that at 160 millimeter tube length, sixteen millimeter and thirty-five millimeter objectives and a 10 x eyepiece were needed. Accordingly, the eyepiece micrometer was calibrated against a stage micrometer for each of these two magnifications. Measures of the amplitude of vibration of the tip of the prong of the fork were then made for given current values, which were read from the Weston ammeter, at close intervals through the working range of the apparatus.

Calibration Curve.—The amplitude of prong vibration was plotted as a function of the exciting current in logarithmic coördinates (Fig. 5). The points lie essentially in a straight line; it is easily seen which of the observed readings are in error. This line has an inclination of sixty degrees with the horizontal, which has a distinct bearing on the determination of the mathematical law of behavior of the apparatus.

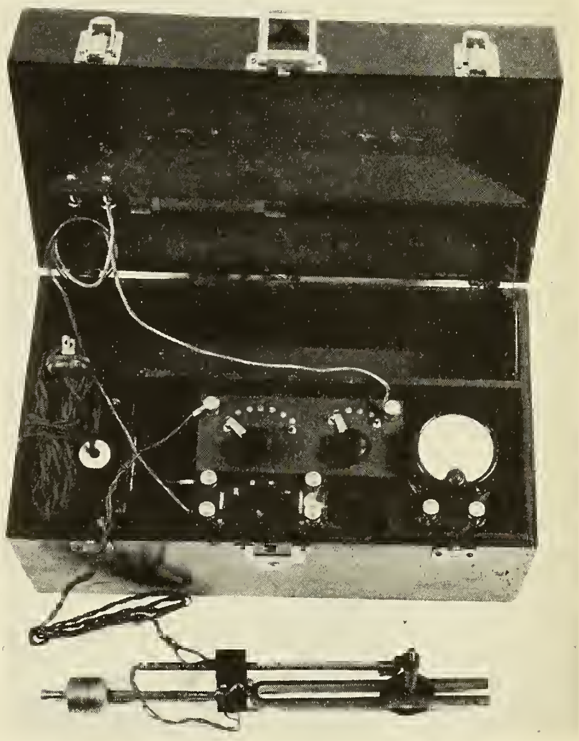

Fig. 3. Assembled apparatus.

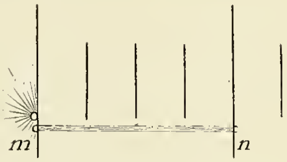

Fig. 4. See section on Calibration.

Determination of Behavior of Apparatus.—The slope of any line is defined as the tangent of the angle which the line makes with the X axis or with any line parallel to the X axis. Assume a line FG as in Figure 6, which has a slope *m* and which passes through the point P_1 (coördinates a, b). Let P(x, y) be any other point on the line. The slope of the line FG is $\frac{y-b}{x-a}$, which by hypothesis is equal to m, or $\tan \phi$. Then $\frac{y-b}{x-a} = m$ is an equation which holds true for all points on the line (P having been taken as any point on the line) and for no other points, and is, therefore, the equation of the line.

Now consider the data which have been found to determine a straight line when plotted in logarithmic coördinates. It is to be remembered that the coördinates numbered along the axes do not represent uniform divisions but do represent divisions proportional to the logarithms of the respective numbers indicated. Therefore, any value Y in logarithmic coördinates is the equivalent of the log of the corresponding value y in uniform coördinates, or $Y = \log y$, $X = \log x$, etc.

The equation of the straight line in the logarithmic coördinates is

$$\frac{Y-B}{X-A} = m \text{ or } Y - B = m\ (X - A).$$

Substituting in this equation, $Y = \log y$, $X = \log x$, etc.,

$$\log y - \log b = m\ (\log x - \log a),$$

$$\log \frac{y}{b} = m\ (\log \frac{x}{a})$$

$$\log \frac{y}{b} = \log \left(\frac{x}{a}\right)^{m}$$

This is the equation of the line as expressed in terms of uniform coördinates. Into this general equation, values of a and b as determined from the experimental data may be substituted to solve for the definite numerical equation which satisfies the data. The value of m in this substitution is the slope of the line as plotted in logarithmic coördinates. This line has an inclination of sixty degrees from the horizontal so the slope is tan sixty degrees or $\sqrt{3}$. Any point on the line may be taken for its values of a and b; for example, the point (0.84, 0.058) is taken here.

$$\frac{y}{0.058} = \frac{x}{(0.84)}^{1.732}$$

$$y = 0.078\,x^{\sqrt{3}}$$

where y is the amplitude of vibration in millimeters and x is the exciting current in amperes.

This is the final equation for the law of behavior of the apparatus and the equation is true for all values which lie on the line. The constant 0.078 is fixed by the design of the fork and would be changed if the fork or the coil or their relative positions were in any way altered. The fundamental relation, $y = K x^{\sqrt{3}}$, would remain in any event but would require a new calibration for the determination of the new value of K.

Discrepancies in data at the higher values.—The projection of the calibration curve to the higher values of current and amplitude appears in the upper left quadrant of the graph (Fig. 5). The amplitude as shown by the laboratory data is seen to start increasing at a slightly lower rate than the current. This is due to the magnetic saturation curve of the iron core of the exciting coil. The flux in magnetic materials varies directly with the magnetomotive force or with the ampere turns at low flux densities, as shown in Figure 7, until the material begins to reach a point of magnetic saturation. At that point, commonly called the knee of the saturation curve, a greater magnetomotive force is required to force through additional flux, until finally at complete saturation no additional magnetomotive force can increase the flux further.

This apparatus has been so designed that, through the usual working range of amplitude desired, the iron core is worked below the knee of the saturation curve and hence, for practical purposes, the flux is directly proportional to the current in the coil, allowing the saturation curve to be neglected in the calculations.

Calculation of Thresholds.—The current in amperes necessary to excite appreciable vibrations of the prongs of the fork was calculated by multiplying the ammeter deflection by the current ratio. Thus, if the ammeter reading was 0.6 and the ratio of current through the transformer 5:1, the exciting current was $5 \times 0.6 = 3.0$ amperes. The amperes of current (3.0) being known, one can read directly from the calibration curve (Fig. 5) the amplitude of vibration of the prongs of the fork, in this case 0.516 millimeters.

Obviously, the amplitude of vibration in millimeters is the numerical expression of the vibratory sense threshold; the greater the fork vibrates before the vibrations are perceived the higher the threshold value. This assumes that the base of the fork vibrates in proportion to the tip of the prongs of the fork. An attempt was made to measure the vertical amplitude of vibration of the base of the fork. Microscopic observation of the base, at a magnification of 400 diameters, shows the base to be moving elliptically rather than vertically. Further, the long diameter of this ellipse is not exactly in the longitudinal axis of the fork. In spite of the rather complicated and disturbing behavior of the base, as seen under the high magnification necessary, it is hardly conceivable that the base of the fork does not vibrate in proportion to the prongs. For the purposes of this study the assumption is made that the base does vibrate proportionately to the prongs, though it is admitted that a measure of vibration of the base could not be made and a search of the literature reveals no proof on this point.

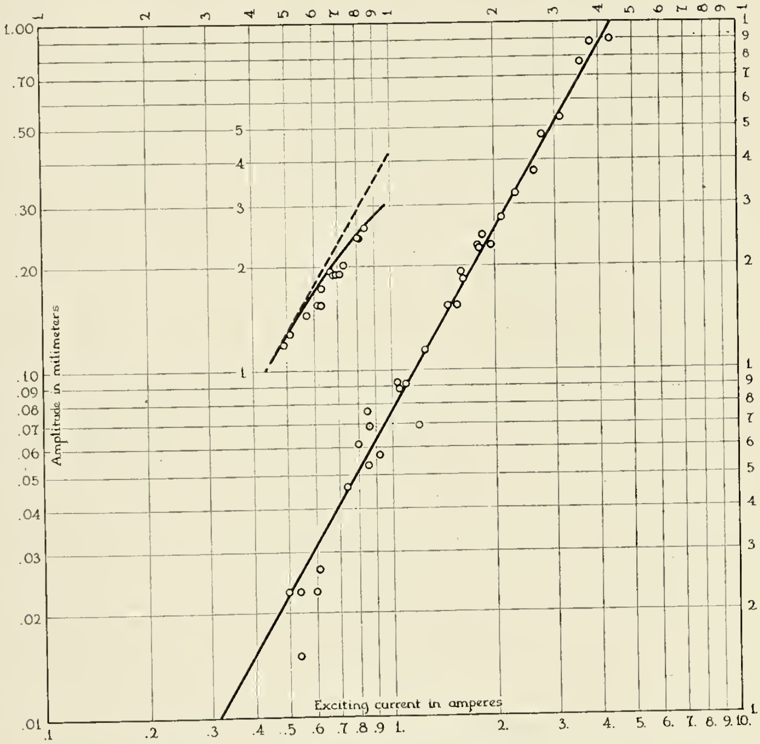

Fig. 5. Calibration curve in logarithmic coördinates; reference graph for determination of thresholds.

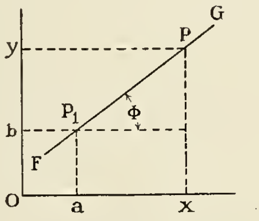

Fig. 6. See section on Determination of behavior of apparatus.

The greatest amplitude of vibration at the tip of the prongs of the fork which this apparatus is capable of generating, without striking the pole piece, is 2.80 millimeters. As the inductance coil becomes heated the resistance in the circuit increases. The current flowing through the apparatus decreases and the amplitude of vibration of the prongs of the fork consequently becomes

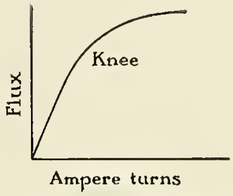

Fig. 7. See section on Discrepancies in data at the higher values.

TABLE I. THRESHOLDS IN NORMAL INDIVIDUALS IN TERMS OF MILLIMETERS OF AMPLITUDE OF PRONG OF TUNING FORK

Case No.	Diagnosis	Sex	Age	Height Inches	Weight Pounds	Arterio-sclerosis	Lateral epicondyle humerus		Styloid process ulna		Dorsum 2nd phal. 3rd digit		Ant. sup. iliac spine		Med. surface tibia		Lat. malleolus fibula		Sternum	C VII Spine	T VI Spine	T XII Spine	Sacrum	Post. thigh Left
							Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left						
1	Causalgia	M	13	60	83	0	0.035	0.021	0.039	0.031	0.052	0.039	0.052	0.045	0.061	0.047	0.052	0.052	0.021	0.088	0.076	0.098	0.104	0.350
2	Sinusitis	M	15	58	75	0	0.052	0.039	0.047	0.052	0.039	0.035	0.104	0.071	0.098	0.088	0.093	0.104	0.056	0.173	0.275	0.403	0.137	0.860
3	Mastoiditis	F	16	65	123	0	0.118	0.137	0.104	0.104	0.052	0.071	0.237	0.213	0.166	0.173	0.137	0.152	0.088	0.173	0.166	0.137	0.350	1.620
4	Mastoiditis	F	23	64	111	0	0.130	0.112	0.076	0.093	0.061	0.045	0.275	0.180	0.130	0.188	0.173	0.159	0.082	0.376	0.430	0.300	0.895	2.340
5	Normal person (Intern)	M	24	63	151	0	0.096	0.098	0.039	0.063	0.021	0.041	0.255	0.255	0.221	0.229	0.169	0.169	0.024	1.460	0.975	0.936	1.658	1.070
6	Retroversion	F	25	68	118	0	0.376	0.112	0.220	0.118	0.275	0.152	0.546	0.321	0.229	0.237	0.220	0.213	0.166	0.403	0.321	0.583	2.186	2.340
7	Hernia	M	36	69	155	0	0.350	0.180	0.173	0.104	0.104	0.112	1.023	0.860	0.245	0.255	0.204	0.265	0.130	0.748	0.610	0.350	1.620	2.340
8	Sinusitis	M	37	69	180	0	0.196	0.173	0.066	0.088	0.043	0.052	0.255	0.486	0.213	0.180	0.321	0.220	0.137	0.275	0.350	0.403	0.860	2.340
9	Cataract	M	40	66	175	0	0.173	0.130	0.118	0.076	0.076	0.052	0.430	0.376	0.300	0.220	0.275	0.255	0.082	0.458	0.350	0.350	0.458	2.340
10	Eye trauma	M	41	65	128	0	0.300	0.288	0.166	0.180	0.173	0.152	0.825	0.711	0.458	0.679	0.546	0.430	0.245	1.070	0.936	0.860	0.679	2.340
11	Herniotomy	M	41	62	122	0	0.403	0.229	0.180	0.180	0.144	0.047	0.275	1.620	0.255	0.486	0.516	0.430	0.123	0.430	2.023	0.376	2.340	2.340
12	Endometritis	F	43	66	120	0	0.188	0.137	0.137	0.144	0.104	0.093	0.546	0.679	0.403	0.430	0.321	0.610	0.104	0.785	1.023	1.213	1.696	2.340
13	Myoma-uterus	F	44	66	154	0	0.255	0.204	0.275	0.098	0.321	0.061	0.860	0.516	0.644	0.825	1.136	0.860	0.144	1.250	2.340	1.380	2.340	2.340
14	Hemorrhoids	F	44	67	116	0	0.118	0.173	0.144	0.052	0.052	0.031	0.213	0.376	0.173	0.275	0.156	0.233	0.104	0.860	0.255	0.173	1.180	0.644
15	Perineal repair	F	47	69	136	0	0.213	0.076	0.088	0.061	0.066	0.039	0.546	0.350	0.430	0.204	1.320	0.213	0.088	0.350	0.679	0.403	0.679	1.250
16	Duodenal ulcer	M	50	68	153	0	0.220	0.115	0.166	0.093	0.204	0.118	1.100	1.380	0.152	0.144	0.159	0.137	0.079	1.136	0.825	0.679	0.486	2.340
17	Sinusitis	M	52	70	157	0	0.204	0.220	0.152	0.130	0.166	0.104	0.610	0.516	1.860	0.895	1.070	0.300	0.144	1.250	1.250	0.516	2.340	2.340
18	Asthma	M	53	68	152	sl.	0.144	0.104	0.112	0.144	0.082	0.039	0.486	0.403	0.403	0.458	0.156	0.255	0.088	0.403	0.403	0.458	1.180	1.620
19	Hyper. prostate	M	56	72	153	mod.	0.321	0.245	0.213	0.255	0.430	0.895	1.250	1.213	1.950	2.110	1.620	1.773	0.204	1.320	1.180	0.936	2.340	2.340
20	Bladder stone	M	56	68	165	0	0.255	0.229	0.188	0.166	0.152	0.137	1.620	1.250	1.620	2.023	0.516	0.860	0.098	1.213	0.644	0.936	1.320	2.340
21	Cataract	M	58	70	161	sl.	0.860	0.300	0.120	0.120	0.144	0.063	2.340	1.180	1.696	1.100	1.860	1.380	0.120	0.895	2.340	0.711	2.340	2.340
22	Cataract	M	58	65	131	0	0.486	0.245	1.100	0.204	0.516	0.245	2.023	0.860	1.950	2.340	2.340	2.340	0.275	2.340	2.186	1.620	2.340	2.340
23	Cataract	M	58	71	169	sl.	0.112	0.130	0.137	0.152	0.047	0.052	1.023	0.583	0.679	0.516	1.070	0.748	0.066	0.350	0.255	0.430	1.620	2.340
24	Simple thyroid adenoma	F	59	60	148	0	0.311	0.255	0.275	0.376	0.255	0.300	2.340	1.620	0.895	0.785	0.597	0.936	0.679	2.340	2.110	1.696	2.340	2.260
25	Cataract	M	60	66	125	0	0.233	0.516	0.213	0.679	0.104	0.237	2.340	2.340	0.546	1.180	2.340	2.340	0.137	2.340	0.748	0.430	2.340	2.340
26	Otitis media	M	62	67	147	sl.	0.403	0.350	0.166	0.130	0.104	0.098	1.536	2.023	1.460	1.285	1.950	1.620	0.213	0.936	0.748	0.516	2.340	2.023
27	Cataract	M	67	68	171	0	0.237	0.098	0.156	0.093	0.135	0.173	0.975	0.860	0.825	0.936	1.250	1.100	0.144	1.950	2.340	1.620	2.260	2.260
28	Glaucoma	M	68	64	120	mod.	0.516	0.173	0.166	0.093	0.196	0.104	1.136	0.679	0.825	0.403	0.748	0.376	0.220	2.340	2.340	1.620	2.340	2.340
29	Cataract	M	68	64	117	sl.	0.220	0.245	0.137	0.403	0.173	0.123	2.340	2.340	0.300	0.583	0.229	0.516	0.204	1.320	1.773	0.895	2.340	2.340
30	Gastric ulcer	M	71	72	139	mod.	0.229	0.275	0.180	0.204	0.188	0.159	2.340	1.620	2.340	2.340	2.340	2.340	0.173	1.460	0.516	0.644	2.340	2.340
31	Glaucoma	M	72	69	115	sl.	0.180	0.130	0.229	0.130	0.204	0.066	0.975	0.275	1.070	0.860	1.620	1.136	0.144	1.620	1.320	0.516	2.340	2.340
32	Cataract	M	73	64	142	sl.	0.213	0.173	0.159	0.137	0.220	0.173	0.403	1.100	1.100	0.785	2.186	2.023	0.104	2.100	1.620	0.376	2.340	2.340
33	Cataract	M	74	72	196	sl.	0.376	0.255	0.321	0.165	0.275	0.321	2.260	1.380	1.320	1.250	1.285	1.380	0.173	2.340	2.340	2.260	2.023	2.186
34	Cataract	M	81	70	170	sl.	0.159	0.130	0.144	0.156	0.237	0.245	0.486	0.376	2.023	0.785	2.023	0.825	0.144	0.486	0.679	0.458	1.696	2.340

0 = absent; sl. = slight; mod. = moderate.

TABLE II. PERTINENT CLINICAL DATA ON PERNICIOUS ANEMIA PATIENTS

Case No.	Subacute combined degeneration	Hg.	R.B.C. in millions	Biceps reflex		Triceps reflex		Patellar reflex		Achilles reflex		Great toe extension		Abdominal reflexes		Position sense, toes		Muscle pain, calves		Tendon pain, T. Achilles		*Tactile sense	**Paresthesia	**Edema
				R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L			
1	0	60	3.3	+	+	+	+	+	+2	+	+	0	0	+	+	+	+	+	+	+	+	+	0	+
2	Present	86	....	+	+	+	+	+2	+	+	+	0	0	+	+	—1	—1	+	+	+	+	—1 feet	+	+
3	0	53	2.6	—2	—2	—1	—1	—1	—3	+	+	0	0	+	+	+	+	+	+	+	+	+	0	0
4	0	87	....	+	+	+	+	+2	+2	+	+	0	0	0	0	+	+	+	+	+	+	+	0	0
5	Present	83	4.0	+	+	+	+	—3	—1	0	0	+	+	—1	—1	—3	—3	+	+	—1	—1	—1 below knees	0	0
6	Present	88	4.5	+	+	+	+	+	+	+	+	0	0	+	—1	+	+	+	+	+	+	+	+	0
7	Present	43	1.6	+	+	+	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+
8	0	72	2.8	+	+	+	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	+	0	0
9	0	43	1.8	+	+	+	+	+	+	+	+	0	0	—1	—1	+	+	+	+	+	+	+	0	0
10	Present	50	2.6	+	+	+	+	+	+2	+	+2	0	±	+	+	—1	+	+	+	+	+	+	0	0
11	Present	50	1.6	—2	—2	—2	—2	+	+	—1	—3	0	0	+	+	—1	—1	+	+	+	+	—1 fingers	+	+
12	Present	80	2.7	+	+	+	+	+2	+2	+	+	0	0	+	+	—2	—2	+	+	+	+	—1 legs and forearms	+	0
13	Present	60	2.1	+	+	+	+	+2	+2	+	+	0	0	+	+	+	+	+	+	+	+	+	0	+
14	Present	80	3.8	+	+	+	+	—1	0	0	0	0	0	0	0	+	+	+	+	+	+	—1 below knees	0	0
15	Present	93	3.7	+	+	+	+	+2	+2	+	+	±	+	—1	—2	—1	—2	+	+	+	+	—1 below knees and elbows	+	0
16	Present	83	3.7	+	+	+	+	—2	—2	—3	—3	0	0	—3	—3	—2	—1	+	+	+	+	—1 legs	+	+
17	0	70	2.9	+	+	+	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	+	0	0
18	Present	60	2.1	+	+	+	+	+2	+2	+	+	±	+	—2	—2	—3	—3	—1	—1	—1	—1	—1 below knees	+	0
19	Present	83	4.1	+	+	+	+	+2	+2	—3	—3	+	+	—1	—1	—1	—1	+	+	+	+	—1 below knees and elbows	+	+
20	0	57	2.2	+	+	+	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	+	0	0
21	Present	63	2.7	—2	+	—2	—2	—1	—2	—3	—3	0	0	—2	—3	+	—1	+	+	+	+	—1 below knees and wrists	+	0
22	Present	56	2.1	+	+	+	+	+2	+2	+2	+2	0	0	+	+	+	+	+	+	+	+	—1 below knees	+	+
23	Present	78	2.6	+	+	+	+	0	0	0	0	+	0	0	0	—1	—1	+	+	+	+	+	+	+
24	0	73	2.3	+	+	+	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	+	0	0
25	Present	70	2.9	+	+	+	+	—2	—2	—1	—1	0	0	+	+	—1	—1	+	+	+	+	—1 below elbows and mid thighs	+	+
26	Present	55	1.8	—1	+	+	+	—2	—3	—3	—3	±	0	+	+	+	+	+	+	+	+	+	0	0
27	0	89	4.4	+	+	+	+	—3	—3	—3	—3	0	0	0	0	+	—1	+	+	+	+	+	0	0
28	Present	50	2.0	+	+	+	+	+2	+2	+	+	0	0	—1	—1	+	+	+	+	+	+	+	+	0
29	Present	94	3.7	—1	—1	—1	—1	—3	—3	—3	—3	0	0	—1	—1	+	+	+	+	+	+	+	+	0
30	0	81	4.0	+	+	+	+	+	—1	—2	—2	0	0	+	+	+	+	—1	—1	—1	—1	+	0	+

Key to symbols: Present or normal = +; slightly increased = +2; moderately increased = +3; markedly increased = +4; slightly decreased = —1; moderately decreased = —2; markedly decreased = —3; absent = 0; ± = questionable.

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*No patient had pain or temperature sense disturbance.

**Detailed distribution of paresthesias and edema in individual cases is indicated in Table III.

TABLE III. THRESHOLDS IN PATIENTS WITH PERNICIOUS ANEMIA IN TERMS OF MILLIMETERS OF AMPLITUDE OF PRONG OF TUNING FORK

Case No.	Sex	Age	Height Inches	Weight Pounds	Arteriosclerosis	Lateral epicondyle humerus		Styloid process ulna		Dorsum 2nd phal. 3rd digit		Ant. sup. iliac spine		Med. surface tibia		Lat. malleolus fibula		Sternum	C VII spine	T VI spine	T XII spine	Sacrum	Post. thigh Left
						Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left						
1	F	17	67	136	0	0.021	0.027	0.056	0.039	0.021	0.021	0.071	0.052	e 0.159	e 0.082	0.188	0.088	0.018	0.516	0.376	0.275	0.936	0.255
2	M	29	68	137	0	0.104	0.076	0.112	0.096	0.275	0.192	0.182	0.311	p 0.300	p 2.340	p 0.565	e, p 2.340	0.052	0.403	1.320	0.275	2.340	2.340
3	F	31	64	110	0	0.112	0.180	0.166	0.159	0.144	0.104	0.516	0.430	0.350	0.137	0.275	0.213	0.130	0.610	0.300	0.350	2.340	2.340
4	F	37	68	144	0	0.458	0.255	0.363	0.144	0.192	0.363	1.250	0.565	2.340	2.260	2.340	2.340	0.336	0.644	0.679	0.583	2.340	2.340
5	M	38	65	132	0	0.152	0.275	0.118	0.123	0.144	0.088	2.340	1.536	2.340	2.340	2.340	2.340	0.255	2.340	0.679	0.679	2.340	2.340
6	M	44	69	142	0	0.104	0.137	0.082	0.098	0.052	0.076	1.136	0.711	p 2.340	p 2.340	p 2.186	p 2.340	0.104	0.860	0.376	1.620	0.860	2.340
7	F	44	63	127	0	0.229	0.233	0.188	0.128	0.104	0.128	2.340	2.340	p 2.340	p 2.340	e, p 2.340	e, p 2.340	0.486	2.340	2.340	2.340	2.340	2.340
8	M	47	65	135	0	0.376	0.627	0.275	0.376	0.350	0.245	1.250	1.023	0.430	1.380	0.376	0.785	0.516	1.696	1.950	1.536	1.250	2.340
9	F	47	62	145	0	0.376	0.173	0.245	0.112	0.213	0.137	1.100	0.825	0.679	0.785	1.070	1.213	0.237	0.711	0.583	0.936	1.460	2.340
10	M	48	73	135	0	0.321	0.118	0.275	0.255	0.336	0.137	1.950	1.213	0.679	1.320	0.895	1.950	0.430	0.711	0.825	0.975	2.340	2.340
11	F	48	67	142	0	p 0.166	p 0.118	0.181	0.131	p 0.104	p 0.104	1.070	0.785	e, p 1.100	e, p 0.376	e, p 1.620	e, p 0.546	0.709	p 1.070	p 0.860	p 0.516	1.620	2.340
12	M	49	66	114	0	0.516	0.516	p 1.320	p 0.975	p 0.748	p 1.180	2.340	2.340	p 2.340	p 2.340	p 2.340	p 2.340	0.546	2.340	2.340	2.340	2.340	2.340
13	M	52	66	125	0	0.321	0.300	0.300	0.275	0.255	0.233	2.340	2.340	1.180	1.320	e 2.110	e 2.186	0.376	2.340	2.340	2.340	2.340	2.340
14	F	53	65	159	0	0.695	0.516	0.546	0.501	0.516	0.767	2.340	2.340	2.340	2.340	2.340	2.340	0.430	2.340	2.260	0.376	2.340	2.340
15	M	55	71	157	0	1.536	0.644	p 1.620	p 0.430	p 0.748	p 0.403	2.340	2.186	p 2.340	p 2.340	p 2.340	p 2.340	0.350	1.536	1.380	2.340	2.340	2.340
16	F	57	62	105	sl.	0.711	0.376	1.070	0.321	p 1.136	p 0.486	2.340	2.340	e 2.340	e 2.340	2.340	2.340	0.321	2.340	2.340	2.340	2.340	2.340
17	M	58	67	193	0	1.180	0.644	1.773	0.711	0.430	0.583	2.340	1.773	0.711	0.975	0.860	0.895	0.350	2.340	2.340	2.340	2.340	2.340
18	M	59	66	146	0	0.546	1.070	0.516	1.047	p 1.860	1.158	2.186	2.186	p 2.340	p 2.340	p 2.340	p 2.340	0.565	2.340	2.340	2.340	2.340	2.340
19	F	59	65	125	0	1.860	1.213	1.696	0.895	p 1.620	p 0.785	0.860	2.110	e 2.340	e 2.340	e, p 2.340	e, p 2.340	0.376	2.340	2.023	2.340	2.340	2.340
20	M	60	68	128	mod.	0.430	0.245	0.350	0.180	0.255	0.229	1.213	0.748	1.420	0.936	1.696	1.950	0.118	2.110	1.696	1.250	2.340	2.340

21	F	60	66	107	0	0.516	0.644	2.340	0.173	p 2.340	p 0.583	2.340	2.340	2.340	2.340	p 2.340	p 2.340	0.321	2.340	1.100	1.536	2.340	2.340
22	M	61	67	113	0	0.936	1.420	1.100	0.860	0.679	0.785	2.340	2.340	p 2.340	p 2.340	e, p 2.340	e, p 2.340	0.458	2.340	2.110	2.023	2.340	2.340
23	F	61	62	141	sl.	0.166	0.516	0.321	0.610	p 0.376	p 0.458	2.340	2.340	2.340	2.340	e 2.340	e 2.340	0.275	2.340	2.340	2.340	2.340	2.340
24	M	62	65	110	sl.	0.430	0.233	0.255	0.204	0.213	0.173	1.773	2.340	1.320	0.546	1.180	0.860	0.144	2.340	2.340	2.340	2.340	2.340
25	F	70	64	100	mod.	0.145	0.137	0.229	0.166	p 0.229	p 0.213	2.186	1.696	e 1.213	e 0.936	e 1.320	e 1.023	0.237	2.340	2.340	1.536	2.340	2.340
26	M	72	67	160	sl.	1.950	1.620	0.711	0.895	0.516	0.458	2.340	2.340	2.340	2.340	2.340	2.340	0.583	2.260	1.860	1.696	2.340	2.340
27	M	72	64	147	0	0.221	0.181	0.145	0.213	0.118	0.104	0.350	0.123	0.255	0.516	0.486	0.546	0.130	1.950	1.620	1.380	1.950	1.860
28	F	78	61	96	sl.	0.076	0.112	0.052	0.071	0.047	0.056	1.250	1.100	1.380	1.696	p 1.950	p 2.186	0.088	1.620	1.460	1.773	2.340	2.340
29	M	79	72	188	mod.	0.275	0.213	0.458	0.288	p 0.255	p 0.610	2.340	2.340	2.340	2.340	2.340	2.340	0.255	1.100	0.936	0.583	2.340	2.340
30	M	83	66	160	sl.	0.546	0.516	0.486	0.583	0.679	0.644	0.785	0.679	e 2.110	e 1.320	2.023	1.536	0.350	2.340	1.696	2.340	2.340	2.340

0 = absent; sl. = slight; mod. = moderate; e = edema; p = paresthesia

less. The greatest constant amplitude with this apparatus is 2.34 millimeters. This value therefore was taken as the upper limit of the threshold of vibratory acuity in this study.

CLINICAL TECHNIC

All patients examined were made comfortable in bed in a quiet room. The fork, vibrating sufficiently to be perceived well, was placed upon the sternum to acquaint the patient with the sensation to be tested. The fork was always placed vertically to the bone. It was necessary to wait twenty seconds after turning on the current before overtones in the fork had disappeared. The patient was asked to describe the sensation to make certain he was differentiating it from pressure of the fork. Several trial tests were made with the fork in vibration and at rest; the patient was requested to indicate when it was in vibration and when it was not.

Then the fork, vibrating at an amplitude estimated to be below the threshold of the point to be tested, was placed over the point. If the patient did not perceive the vibrations, the fork was lifted from the body surface and the current increased. After twenty seconds, the fork was reapplied to the body, care being taken to place it exactly on the same point as previously. The base of the fork left its circular imprint on the skin so it was relatively easy to replace it on the same site. The current was thus increased to the point at which the patient just perceived the vibrations for a period of ten seconds. An average of three readings over each point was taken as the threshold.

The patient was instructed to rest his extremities squarely upon the bed, that is, to relax. If he pressed down firmly on the bed he could often feel the vibrations in distal portions of an extremity before they were perceived in the proximal points. The patient's facial expression was frequently an indicator of his perception; the countenance would light up coincident with the recognition of the vibrations of the fork. The right half of the body was tested first, then the left half and finally the back. The current was turned off at intervals to test the patient's attention.

OBSERVATIONS ON NORMAL AND PERNICIOUS ANEMIA PATIENTS

For purposes of comparison, thirty-four normal individuals, ages thirteen to eighty-one years, inclusive, were studied. They were all patients in the Minnesota General Hospitals; their complaints were strictly medical and their abnormalities did not involve the nervous system. A searching neurologic examination, performed by the writer, was negative in each case. Only persons of normal intelligence and apparently normal emotional balance were tested in this group. The conditions which brought the patients to the hospital are listed in Table I under the heading of Diagnosis.

Thirty other persons, ages seventeen to eighty-three years, inclusive, suffering from pernicious anemia, were studied. Fourteen of these persons were tested at the Boston City Hospital through the courtesy of Doctors Castle and Heath. Table II gives the clinical status of the pernicious anemia patients and indicates those having subacute combined degeneration. These patients were not selected to include or exclude neurologic complications. All patients tested, both normal and those with pernicious anemia, had negative blood Wassermann tests, some from two laboratories. The vibratory acuity over eighteen different points of the body was determined.

Tables I and III show the vibration sense thresholds of the points tested. The threshold values are computed from the amperes of exciting current, as described under Calculation of Thresholds. The patients examined are listed according to age as can be seen in column two of the tables. Such an arrangement was found convenient in constructing the threshold graphs (Figs. 8 to 16, inclusive).

The threshold graphs have been plotted as amplitudes of vibration of the free end of the prongs of the fork in millimeters along the ordinate against ages in years of the patients along the abscissa. Sexes are not differentiated in the graphs. Normal cases are shown as black dots, and pernicious anemia patients as open circles. A vertical line through the circle indicates that the patient also has subacute combined degeneration. A horizontal line signifies that he has paresthesias and the addition of an outer circle to the symbol denotes that he has edema at the point tested. This point is indicated at the top of each figure.

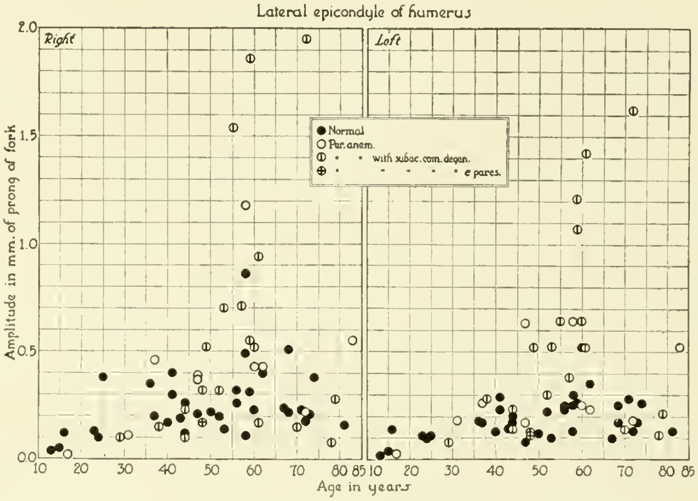

Fig. 8. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

Certain general conclusions are immediately evident from a superficial inspection of the series of threshold graphs.

1. Younger people, in general, have lower vibration sense thresholds than older individuals.

2. There is a considerable spread in the thresholds over all points tested, both in the normal and pernicious anemia patients.

3. In general, vibratory acuity is somewhat reduced in pernicious anemia.

4. A large number of patients, both normal and pathological, have thresholds above 2.34 millimeters.

(5) More pernicious anemia patients with than without subacute combined degeneration have thresholds above 2.34 millimeters. These

observations and individual differences therefrom will not be discussed.

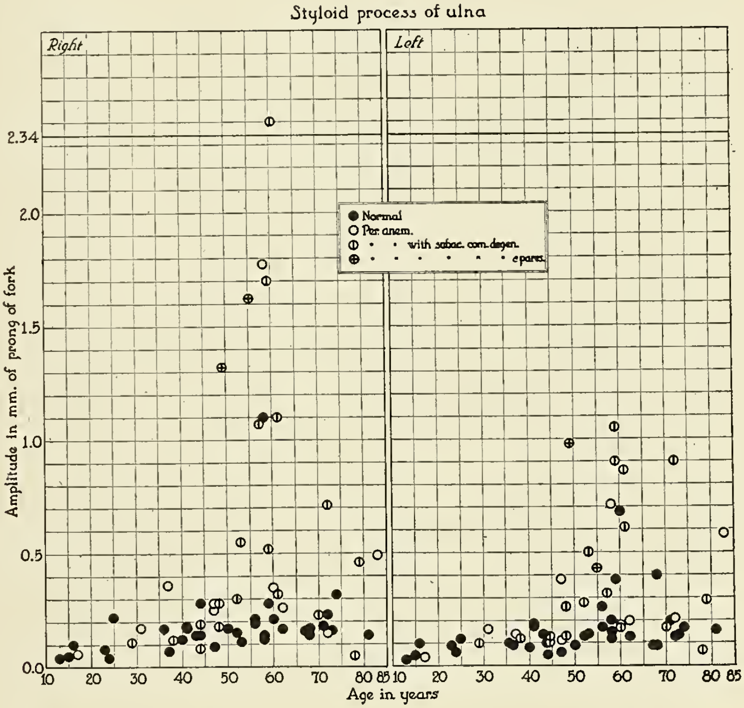

Fig. 9. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

The vibratory perception of all patients, both normal and those with pernicious anemia, was slightly more acute in the left side of the body than in the right, except over the medial surface of the tibia and the lateral malleolus of the fibula, where the pernicious anemia patients had better perception on the right. Three normal persons (Cases 9, 15 and 21) had better perception in the entire left half of the body than in the right; the reverse was never observed, either in normal or pathological cases. All the patients were right-handed; consequently, no correlation between the right or left-handedness and vibratory acuity on the respective sides of the body could be shown in this series of cases. In all patients where the readings over the extremities, either upper or lower, were approximately equal on the two sides, the thresholds were high.

The lateral epicondyle of the humerus (Fig. 8) is a difficult point to test. The fork easily slides off the bony prominence; this slight trauma to the tissues sometimes causes the patient discomfort and so may interfere with good reception of vibratory stimuli. No patient had a threshold above the working range of the apparatus. The greatest individual reduction in vibratory acuity in both the normal and pernicious anemia patients was on the right. One patient only had paresthesia. His vibratory acuity was better than the average normal or pernicious anemia patient tested. Over both humeri the threshold of several pernicious anemia patients exceeded the highest normal threshold. Most of these pernicious anemia patients were those who had subacute combined degeneration. No edema was present over the lateral epicondyle.

Similar observations were made in the readings over the *styloid process of the ulna* (Fig. 9). In the normals the thresholds over the right and left styloid processes were more nearly equal than in the case of the right and left lateral epicondyles. Several pernicious anemia patients had thresholds higher than any normal patient. As over the lateral epicondyles, pernicious anemia patients past fifty years of age had the highest thresholds. The threshold of one individual exceeded the working range of the apparatus. Of the five pernicious anemia patients who had greater reduction in their vibratory acuity over the styloid process of the right ulna than the greatest reduction in any normal individual, four had subacute combined degeneration. Two of the four also had paresthesias. Of the left side, six patients with pernicious anemia had thresholds higher than any normal persons tested. Of these six, five had subacute combined degeneration, and of these five, one had paresthesia. No patient tested had edema over the styloid process.

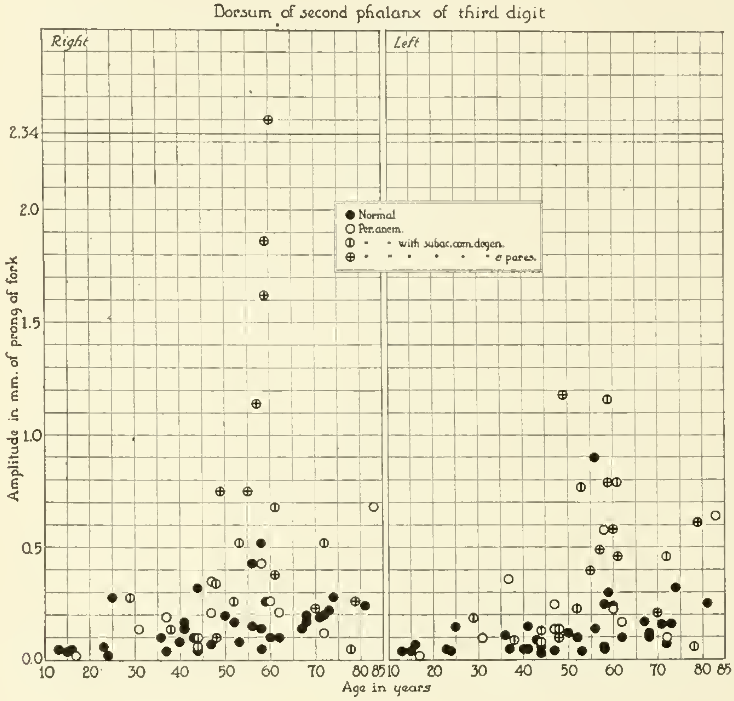

Fig. 10. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

The normal thresholds over the *dorsum of the second phalanx of the third digit* of the hand (Fig. 10) were more scattered than over the epicondyle or styloid process. But the average normal threshold was lower than on any other point tested. The highest individual normal threshold was on the left side, but the average threshold on the left was definitely lower than on the right. Of the right side of the eight pernicious anemia patients whose thresholds were higher than the highest normal, seven had subacute combined degeneration. Of these seven, six had paresthesias. One pernicious anemia patient with paresthesia had a threshold above the greatest constant amplitude of the apparatus. Regularly, over all points tested, where paresthesias were present the patients experienced difficulty in determining their exact vibratory perception thresholds. Usually the paresthesia increased the threshold, though occasionally it seemed to the patient that the fork would be vibrating when it had an amplitude below the average normal. No patient tested had edema in either hand.

The *anterior superior iliac spine* (Fig. 11) was a very difficult point to test accurately, as the site is a small, irregular and rather insecure resting place for the base of the fork. Further, due to the overlying abdominal soft parts, it was often almost impossible to place and maintain the fork vertically. There was considerable spread in all thresholds, especially in the normal individuals. On the average, there was a tendency to a decrease in vibration acuities with increasing age. This tendency was more definite in the pernicious anemia patients. Thirteen pernicious anemia patients did not feel the fork vibrating at its greatest constant amplitude, 2.34 millimeters, over the right iliac spine. Eleven did not feel it over the left side. Only one patient not perceiving it on the right, and one on the left, did not have subacute combined degeneration. But several of them had as good vibration sense as the normals in their respective age group. All patients were free from paresthesias and edema in this site.

The *medial surface of the tibia* (Fig. 12), tested midway between the knee and ankle joints, and the lateral malleolus of the fibula, which will be discussed later, gave the most interesting and valuable reading. This is an excellent resting place for the base of the fork. Even on the surface of this bone, however, there are irregularities; before placing the fork the area was palpated slightly to locate the smoothest site. Normal individuals showed a definite tendency toward a progressive decrease in vibratory acuity with age; the decrease was particularly noticeable after the age of forty. This observed decline in vibration sense agrees with quantitative estimations made by Pearson.[22] Only one normal person was unable to perceive the vibration at 2.34 millimeters over the right tibia, and two over the left tibia. In general, patients with pernicious anemia had a much greater reduction in vibratory perception than normal patients, but several pernicious anemia patients had lower thresholds than normal persons of the same or earlier ages. Fifteen of the thirty pernicious anemia patients were unable to feel the fork at its greatest constant amplitude over each tibia. In every case, except one, this loss occurred in patients with subacute combined degeneration. The tibia, therefore, showed a definite relation between loss or severe decrease in vibratory sensibility and cord changes associated with pernicious anemia. Paresthesias were quite common and might have been a factor in the high tibial thresholds. Edema, which was present in some degree over the tibia in six cases, did not seem to exert much, if any, dampening effect on the vibration reception.

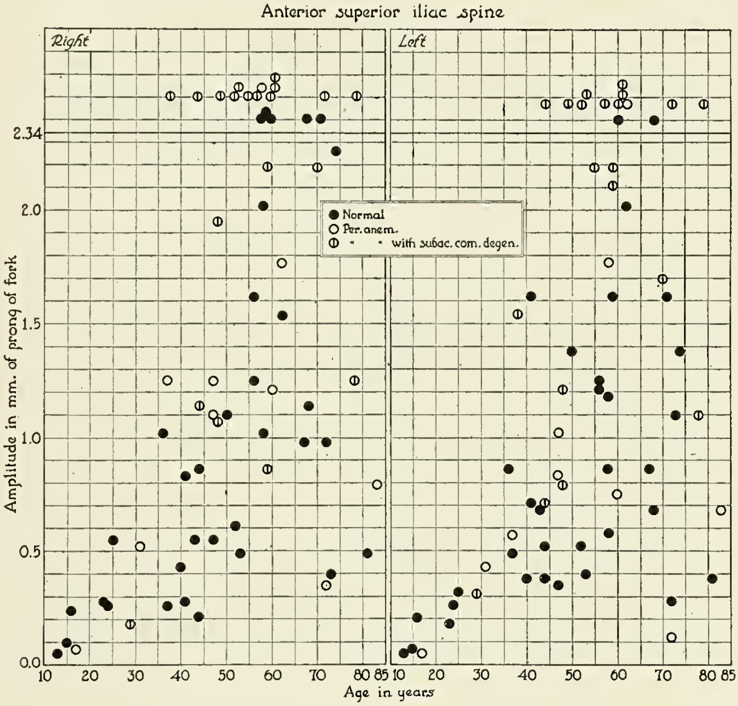

Fig. 11. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

The *lateral malleolus of the fibula* (Fig. 13), like the tibia, showed a progressive age decrease of vibratory sensibility in the normal patients. Three normal individuals were unable to feel the vibration at 2.34 millimeters on the right, and a like number on the left lateral malleolus. Thirteen of the thirty pernicious anemia patients were unable to feel the vibrating fork over the right lateral malleolus; sixteen were unable to feel the fork over the left lateral malleolus. All these twenty-nine patients whose thresholds were above the working range of the apparatus had subacute combined degeneration except two. Of the thirteen pernicious anemia patients who were unable to feel the vibration on the right side, five had paresthesias; of the sixteen on the left, eight had paresthesias. Paresthesias, therefore, appeared to be definitely associated with decrease in vibratory acuity over the lateral malleoli. Edema was more common in those pernicious anemia patients who did not feel the greatest constant vibration than in the case of the tibiæ. Some individuals with edema had vibratory thresholds lower than normal individuals and so it cannot be said that edema itself causes reduction in vibratory perception.

The readings obtained over the *body of the sternum* at the level of the third rib (Fig. 14) were nearly constant for all ages in the normal patients. The thresholds were low and the average value only slightly higher than over the left third digit. One normal person had a threshold practically as high as any pernicious anemia patient. This person, fifty-five years of age, had a slight deformity of the body of the sternum opposite the second intercostal space; the deformity may account for the decline in perception. Patients with subacute combined degeneration had thresholds which were, for the most part, slightly higher than those without subacute combined degeneration. No paresthesias or edema were present over the sternum. Vibration sense loss over the sternum would appear to have more significance than over any other point tested.

The *posterior thigh* at its mid point (Fig. 14) was taken as the testing point to determine any effect heavy soft tissue layers would have on vibratory reception. Of the physiologists, von Frey[24] in particular, insists that vibration sense is received only in the skin, the bone acting as a resonator. In all cases, the thigh showed the greatest reduction in vibratory sensation of any point tested. Twenty-three of the thirty-four normal patients and twenty-eight of the thirty pernicious anemia patients were unable to feel the vibration at the maximum constant amplitude of the fork. In spite of relatively high thresholds as a group, the youngest normal and the youngest pernicious anemia patients had reasonably low thresholds. Neither of the two pernicious anemia patients who were able to perceive the vibration had subacute combined degeneration. None of the patients tested had either paresthesias or edema over this region.

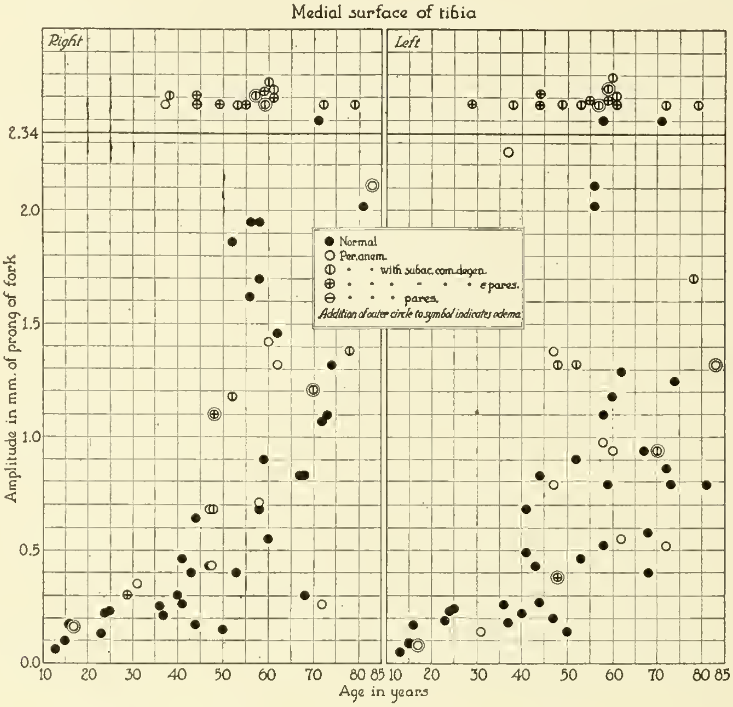

Fig. 12. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

In testing the *spine,* the fork was applied vertically to and upon the spinous processes; the patient lay on his left side with the anterior surface of his body at an angle of approximately forty-five degrees from the plane of the bed. The insecure position of the fork, due mainly to spinous process irregularities, made the vertebræ, like the lateral epicondyle of the humerus and the iliac spine, difficult points to test. Also, over the vertebræ tested (C VII, T VI, T XII) especially over the seventh cervical, the patients had difficulty in differentiating auditory from vibratory sensation. Over the sixth thoracic vertebra, the same difficulty was occasionally encountered, the thoracic cavity possibly acting as a resonator. The vibratory sensibility over the seventh cervical and sixth thoracic vertebræ might conform to Neutra's[11] conception of the sensation as an osteoacusis. However, no patient was perplexed in his sensation over the sternum. Only one pernicious anemia patient (Case 11) had paresthesia in the vertebral region.

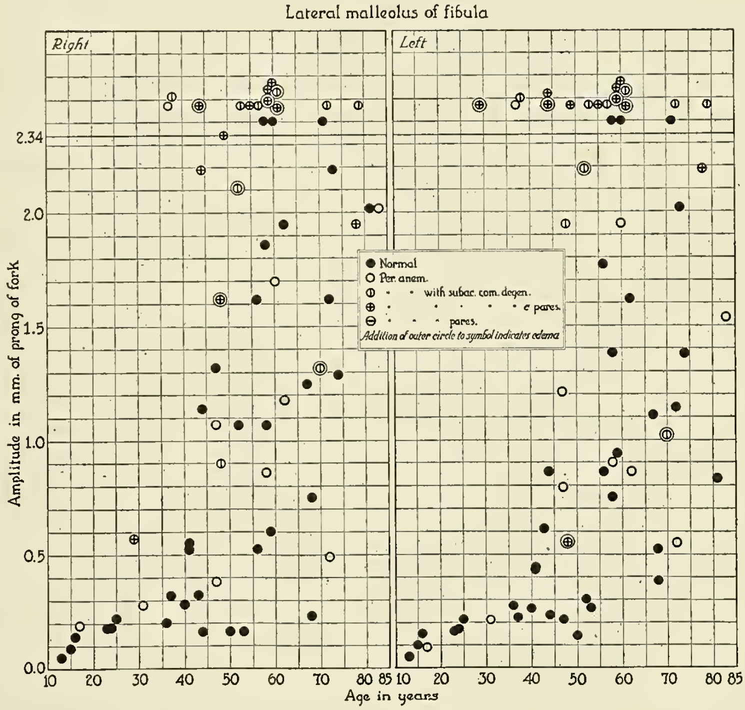

Fig. 13. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

The *spinous process of the seventh cervical vertebra* (Fig. 15) gave very irregular findings both in the normal and pernicious anemia patients. Over this vertebra, as over the iliac spine, the tibia and fibula, there was somewhat of a tendency toward a progressive age decrease in vibratory acuity both in the normal and pernicious anemia patients. More pernicious anemia than normal patients did not feel the vibration at 2.34 millimeters amplitude. As was true over other points tested, there were more pernicious anemia patients with subacute combined degeneration whose thresholds were above 2.34 millimeters than those without degenration of the spinal cord.

One person (Case 11), aged forty-eight, had paresthesia; his threshold was no higher than others of his age. No person had edema over this vertebra.

The *spinous process of the sixth thoracic vertebra* (Fig. 15) also showed great spread in thresholds. Five normal persons, the same number as over the seventh cervical vertebra, had thresholds above the working range of this apparatus. Only nine pernicious anemia patients had thresholds in excess of 2.34 millimeters over this vertebra as compared with fourteen over the seventh cervical vertebra. Persons with subacute combined degeneration showed more loss of vibratory acuity than those without combined system disease, though, again, several had thresholds below the normal. The forty-eight year old pernicious anemia patient with paresthesia had a threshold below the average normal. No person tested had edema over this area.

Vibratory acuity over the *spinous process of the twelfth thoracic vertebra* (Fig. 16) was better than over the other two vertebræ tested. The normal readings tended to be lower in all ages and the average normal was distinctly lower. No normal individual had a threshold exceeding 2.34 millimeters. Eleven of the patients with pernicious anemia had thresholds at or above 2.34 millimeters. Eight of these eleven had subacute combined degeneration. The threshold of the forty-eight year old patient with paresthesia was less than the average normal, as was true over the other vertebræ tested. Again, there were no patients having edema over this vertebra.

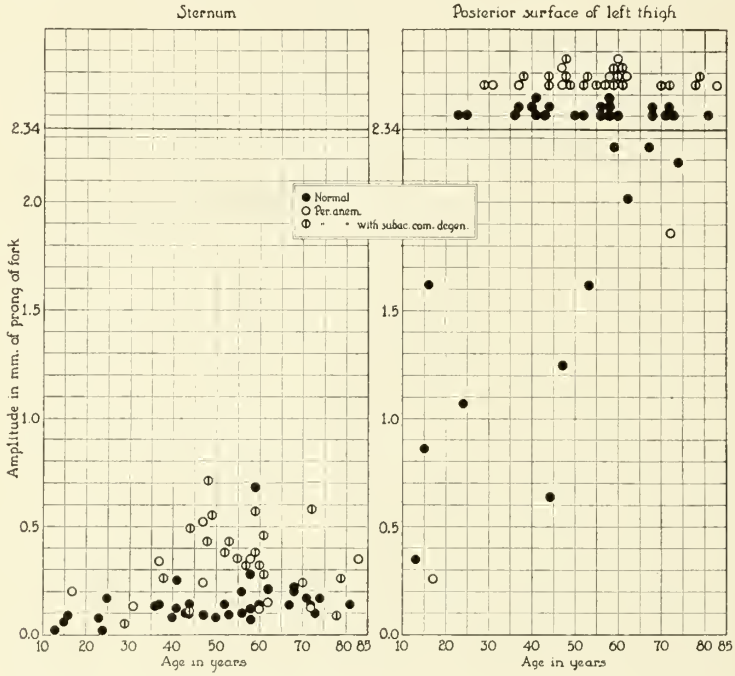

Fig. 14. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

In general, the threshold values over the *sacrum* (Fig. 16) are high in both normal and pernicious anemia patients. Thirteen of the thirty-four normal patients and twenty-four of the pernicious anemia patients had thresholds greater than the working range of the apparatus. Of those twenty-four, eighteen had subacute combined degeneration, while of the six, whose thresholds were below 2.34 millimeters, only two had subacute combined degeneration. None of the patients tested had either paresthesia or edema over the sacrum. Sacral fat pads may be a factor in causing a reduction in vibratory acuity over the sacrum. These findings are not in accord with the statements of practically every writer who has attempted quantitative measures of vibration sense, that decrease in vibratory acuity over the sacrum is a diagnostic sign in tabes dorsalis.

Taken as a group (Fig. 17), the areas tested in the upper extremity and the sternum had the lowest average normal thresholds. A complete or very severe loss of vibration sense in these localities would, therefore, be significant. But the differences between the normal and pernicious anemia patients were not sufficiently great to be a determining point in clinical diagnosis. While, in general, pernicious anemia patients with subacute combined degeneration had somewhat less vibratory acuity than those without demonstrable disease in their spinal cord, yet the number of such patients was too small to permit any general deduction. Over the anterior superior iliac spine, in the majority of cases, the thresholds were very irregular; there was a tremendous spread in the normal thresholds. This point, therefore, appeared to have no value in clinical examination in pernicious anemia. Values obtained over the posterior aspect of the thigh were all very high. This point cannot be tested well with the type of fork used in the usual clinical work.

Over the seventh cervical spinous process and the anterior superior iliac spine there was a tendency to threshold increase with age. This finding was vitiated by certain thresholds in the later periods of life which were no greater than those found in earlier years. In general, the findings were so irregular and the spread so big over the seventh cervical and sixth thoracic spinous processes that testing over these areas for the determination of subacute combined degeneration appears to be without value in the usual clinical examination. Over the twelfth thoracic vertebra, the average normal threshold was lower than that over the other two vertebræ tested. Further, no normal individual had a threshold above 2.34 millimeters. Though this vertebra appears to be a better point to test than the seventh cervical or sixth thoracic, yet it, too, had rather irregular findings and is not well adapted as a point for precise clinical testing. The thresholds obtained over the sacrum were all high. This increase in the thresholds may be due, in some instances, to the presence of sacral fat pads. From this study, sacral dip does not appear to be peculiarly characteristic of tabes. There is a considerable difference between the normal and pernicious anemia patients' thresholds over the tibia and fibula. These two points are relatively free from scatterings in their threshold values. Particularly over the tibia, there is a progressive age increase in the thresholds. These two sites are the most reliable for determining vibration sense disturbances in pernicious anemia.

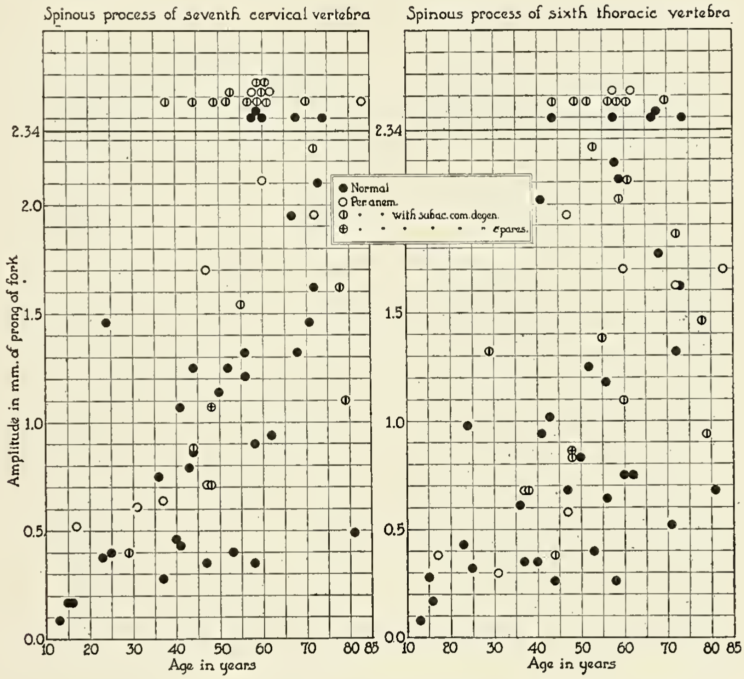

Fig. 15. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

Figure 17 indicates that the eighteen points tested in the normals tend to arrange themselves into three groups according to the vibratory acuity over the points. Thresholds over the upper extremity are lower than those over the lower extremity, and those over the lower extremity are lower than those over the back. The average normal threshold over all points tested was less than in pernicious anemia patients. The mean deviation was so great in all cases except the sternum that the difference between the normal and pernicious anemia patients' thresholds loses its value in precise examination of vibratory sensation.

Intensive study of a single normal individual.—The vibration sense threshold of a hospital intern (Table I, Case 5) was repeatedly determined over a period of ten days on the medial surface of each tibia at a point eight inches above the lower margin of the internal malleolus. The data in this case are given in Table IV, second and third columns. In addition to testing with the base of the fork (one centimeter in diameter) as was done throughout the other parts of this study, tests were made while interposing circular metal plates, two centimeters and four centimeters in diameter respectively, between the base of the fork and the area being tested. These data are collected in Table IV, columns four to seven, inclusive.

It is apparent from the table that, following the first experience or two with the test, this individual improved so that his threshold values subsequently were lower and reasonably uniform. The specific factors at play in determining this fact are not apparent from any observations that were made. It scarcely seems likely that simple fluctuation in attention or improvement with more practice is responsible for the drop of threshold values, as this occurred too abruptly and the subsequent values were too regular.

Referring to the values for the interposition of the metal disks, it is seen that the average threshold was highest for the largest disk. One might argue from this that with the larger disk less of the weight of the fork was transmitted to the underlying bone because of the larger area of padding by the overlying soft parts, but the differences of the averages are so small as to be unconvincing.

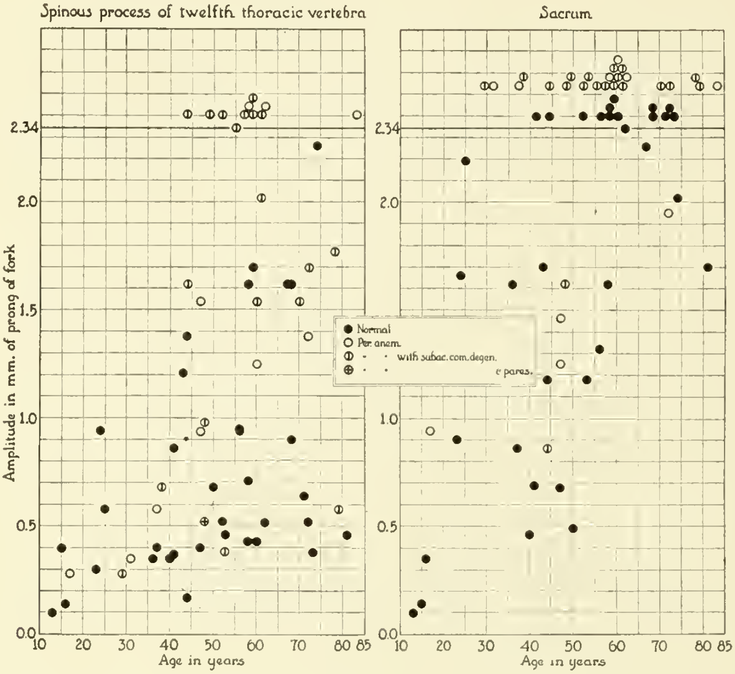

Fig. 16. Individual threshold values plotted according to amplitude of vibration of fork and age of patient.

TABLE IV. THRESHOLDS IN NORMAL INDIVIDUAL IN TERMS OF MILLIMETERS OF AMPLITUDE OF PRONG OF TUNING FORK; VARIATIONS DURING A TEN DAY PERIOD

Diameter of base	1 cm.		2 cm.		4 cm.	
Date	Right	Left	Right	Left	Right	Left
12/ 6/29	0.220	0.229				
1/24/30	0.403	0.112	0.376	0.101	0.546	0.363
1/25/30	0.144	0.021	0.173	0.031	0.300	0.076
1/26/30	0.027	0.015	0.031	0.031	0.039	0.039
1/27/30	0.120	0.041	0.130	0.051	0.123	0.061
1/28/30	0.021	0.018	0.031	0.021	0.031	0.021
1/30/30	0.071	0.056	0.071	0.076	0.071	0.144
1/31/30	0.020	0.076	0.021	0.088	0.031	0.104
2/ 2/30	0.088	0.101	0.063	0.112	0.082	0.173
2/ 4/30	0.018	0.015	0.018	0.018	0.031	0.027
Average	0.113	0.068	0.102	0.059	0.139	0.112
Mean deviation	0.087	0.049	0.083	0.038	0.126	0.076

The main point of interest shown by this experiment is the close correspondence of the threshold values with one another on subsequent days of testing for a given point.

COMMENT

Previous methods used to test vibratory sensibility quantitatively were inadequate. In general, all the methods employed are subject to similar criticisms. First, testing has previously been done by placing the fork, vibrating at an easily appreciable amplitude, on the patient's body and then having the patient indicate when the vibrations are no longer perceived. This is physiologically inaccurate and contrary to generally accepted rules for the precise testing of sensation. If the threshold is determined in this fashion, the patient may become adapted to the sensation and thus will probably perceive it beyond the time when the stimulus is actually effective. The correct method is to approach the threshold of sensation from a subliminal value. The vibration, furthermore, must be maintained at a constant amplitude. Second, many of the forks which have been used were not standardized and a recheck of the values obtained is, therefore, impossible. Finally, none of the quantitative estimations which have been made have been in units which might be examined from a mathematical standpoint and, therefore, the results are all incapable of statistical treatment.

The present apparatus possesses certain distinct advantages. The threshold of vibratory sensation is approached from a subliminal value. The apparatus is standardized and may be duplicated. It is one that may be used any place where 110 volt, sixty cycle current is available. The apparatus is light in weight compared to one which would require another fork or battery to drive it. The weight of the fork, 500 grams, is constant. The results obtained by this method of testing may be expressed in mathematical terms and thus the result treated statistically.

This apparatus and method of testing are subject to certain disadvantages and difficulties. Overtones appear in the fork immediately upon the stepping up of the current to any marked degree. These overtones persist for a period of about twenty seconds, and, therefore, whenever the current is increased, one must wait that twenty seconds before reapplying the fork to the point being tested. The working range of the apparatus is limited, in that its greatest constant amplitude of vibration is 2.34 millimeters at the tip of the prong. This disadvantage could be remedied and the apparatus thus improved in two ways. One might use a fork of sixty double vibrations per second and thereby be able to make the energizing coil between the prongs of the fork of greater size and, consequently, capable of producing greater magnetic force and wider amplitude of vibration of the prongs. Also, the iron core within that coil might be increased in size and so reduce or limit the saturation. There are certain physiological difficulties encountered in testing this sensation, prominent among which is that of paresthesia. Frequently patients suffering from paresthesia have decreased vibratory acuity in the area involved. There are certain other disadvantages which likewise apply to any other form of sensory testing, namely, the presence of fat, edema, temperature disturbances, and attention, intelligence and coöperation of the patient.

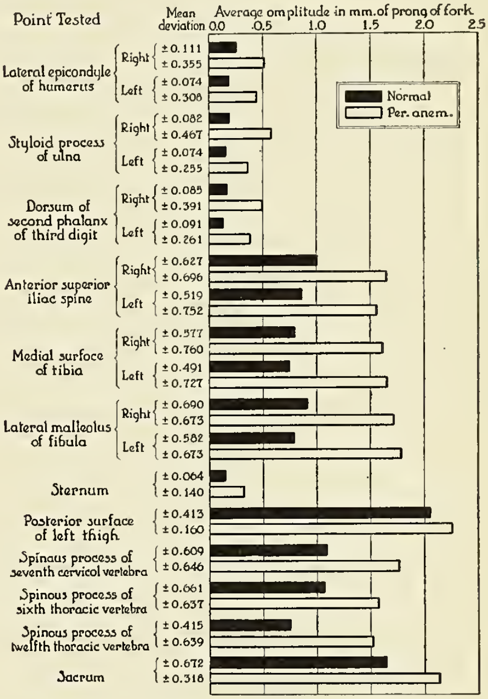

Fig. 17. Average threshold values for all cases on respective points tested.

If, as many physiologists maintain, the skin is the seat of vibratory reception, the sensation should not be so severely reduced as it was over the posterior thigh. The bone appears to have a definite rôle in vibratory reception.

Except in the work of Pearson,[22] the vibratory changes with advancing age have either not been noted or not seriously considered. This decrease in vibratory acuity becomes particularly prominent at about the age of forty. Acquired disease processes in the central nervous system likewise are commonly effective at approximately the same period in life. Age changes must be given consideration in determining the vibration sense threshold, especially in patients with subacute combined degeneration or tabes dorsalis.

While the pathologic cases were studied primarily because they were definitely diagnosed as pernicious anemia and irrespective of their neurologic findings, of the thirty cases of pernicious anemia, twenty had signs of cord involvement. The percentage of central nervous system involvement, therefore, conforms even in this small number of cases with that observed by Woltman,[25] and by Hamilton and Nixon.[26]

SUMMARY AND CONCLUSIONS

1. A new method is described for the determination of vibration sense thresholds with a precision which hitherto has not been attained.

2. Thirty-four normal individuals have been studied by this method with results as follows:

(a) The threshold value at any given point tested in a normal individual tends to be fairly constant at least within a time interval of days.

(b) Different test points in the same individual have different threshold values.

(c) From individual to individual, comparing homologous testing points, one finds a marked variability of the thresholds. This variability increases with age; some older persons have low values, but the tendency is towards decreased acuity, even loss of vibration sense, with increasing age over nearly all points tested. The sternum is a partial exception to this statement.

(d) The threshold values for a fleshy point on the body (posterior thigh) are relatively very high, showing that vibration sense is best perceived through the medium of bone. This does not necessarily mean that vibration sense is strictly an osseous sensation.

3. Thirty pernicious anemia patients were likewise studied, permitting certain conclusions.

(a) Paresthesias cause confusion of interpretation in determining vibration sense threshold values.

(b) As far as the present material constitutes evidence, edema is only a slightly disturbing factor in the determination of threshold values.

(c) At all points tested, the pernicious anemia threshold values were higher on the average than was the case in the normal individuals. On the other hand, the variability in both the normal and pernicious anemia cases was so great and the values for the two groups were so intermingled, that the diagnostic value of the test appears to be much less than one would conclude from reading the literature on pernicious anemia.

(d) Vibration sense determinations in individuals under forty years of age are probably fairly reliable.

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PRESENT STATUS OF SCARLET FEVER PREVENTION AND SERUM TREATMENT*

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Of all infectious diseases there probably is none whose attempted prevention and serum treatment has caused more widespread interest, none which has occasioned so much "curbstone controversy" and yet about which there is such unanimity of opinion in the reports of experienced observers, as scarlet fever.

Prior to the standardization of preparations and methods of immunization and treatment by

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*From the Department of Pediatrics, University of Minnesota, and the Contagious Division, Minneapolis General Hospital. Read at the annual meeting of the Minnesota State Medical Association, St. Paul, May 24, 1932.

TABLE I

Investigator	Number Dick positive	Number injected	Prep.	Doses	Amount	Carried to neg. react.	Reactions (General)	Chance of inf.	Number cases scar	Control cases		Time observed	
										Obser.	Infect.	Inoc.	Control
Dick,[1] 1924-1931	11,584	11,584*	Dick	5	500-100,000	Yes	10%	Intern and nurse	None	?	37 N. & I. not inoc.	4½ yrs.	4½ yrs.
Rhoads,[2] 1931	380	298*	Dick	5	500-80,000	Yes	.24 hos. days lost per nurse	Nurses	None	82 N. ? I.	15 (N. & I.)	3½ yrs.	3½ yrs.
Rhoads,[3] 1931	989	492*	Dick	5	500-80,000	444		Epid.	None	206	11	10 mos.	2 mos.
Knights,[4] 1928-29	53	26*	Dick	5	500-80,000	No		Nurses	None	248	12	1 yr.	1 yr.
Kiefer,[5] 1926-28	799	799*	Dick	4	500-30,000	Yes		Intern	1	Several Inst.	10	3 yrs.	2 yrs.
W. Benson and G. Simpson,[6] 1927	42	42	London & Ed. Univ.	3	200-2,000	37	30% mod.	Nurses	None	145	8	18 mos.	18 mos.
T. Dudley,[7] quoted by J. Townsend, '27	17	17*	Dick	5	500-20,000	No	20%	Epid.	None	23	2	2 mos.	2 mos.
W. H. Park and M. Schroeder,[8] 1928	195	195*	Park N. Y. B. H.	5	26,000 to 46,000		Mod.		None			18 mos.	
A. Lichtenstein,[9] 1930-31	82	82	Comb. pass. & Act.	5	Toxin 300-1,500. bact. ½ to 5 bil.			Epid.	1 (in 5 mo.)	None			
L. D. Hektoen	121	121*				Yes		Nurses Durand	None	517	40	4 yrs.	10 yrs.
Brokman,[11] 1931	16,345	16,345	Toxin	2-3	3,500 S.T.D.	No		School, no exp.	.37% 60 ca.	89,818	1.26%	18 mos.	18 mos.
Brokman,[12] 1931	7,887	7,887	Toxin	2-3	3,500 S.T.D.	No		School, no exp.	.4% 30 ca.	63,920	1.09%		
Platou and Collins[13]	54	54	Zingh.	3	250-500 1,000		12%	Nurses and chil.	None			12-15 mos.	
Platou and Collins[14]	100	100	Larson	2-4	3,000	No			8			12-15 mos.	
Harrington,[15] 1931		9,158	Larson	3 do. to 6,953 cases 1 to 2,205	3,000	No	15%		64	Esti. non-inoc. child pop.	4,579	5 yrs.	5 yrs.
W. B. Park[16]		5,000*	N. Y.	4-5		No		Institutional ch. sev. expo.	None			4-5 yrs.	

the Scarlet Fever Committee, many unfavorable impressions, no doubt, were gained by practitioners regarding the efficacy of scarlet fever toxin and antitoxin. There is reason to believe that these concepts may have resulted from the use of poor preparations, inadequate dosage, improper precautions and fear of serious reactions. The dogmatic "nay" of cursory observers did much to enhance this controversial tendency.

Sufficient time has now intervened, I believe, to permit the accumulation of data sufficient to justify a critical study which may shed some light on these questions.

PREVENTION

The medical literature since 1924 furnishes us with observations on more than fifty thousand persons who have been studied for variable periods of time following inoculation with scarlet fever toxin.

My experience, first with Zingher's preparation, in 1924, then with Larson's ricinoleated toxin, and later with larger graduated doses of Dick's toxin, has afforded me an opportunity to observe 500 inoculated children, 861 inoculated and uninoculated nurses and attendants in the Contagious Division of the Minneapolis General Hospital and 1,200 patients with scarlet fever in whom histories were investigated with respect to previous inoculation. A personal communication from Dr. W. H. Park of New York adds 5,000 institutionalized children to the list of inoculated cases. In addition, Dr. Harrington of the Minneapolis Health Department has kindly given me records on 9,158 children who have been followed since their injections five years ago.

The compilation in Table I includes the cases reported to date in which sufficient details were available to warrant analysis.

Inspection of the table shows that among 18,453 susceptibles (see asterisks in Table I) who were inoculated with approximately the technic recommended by the Scarlet Fever Committee and observed over periods of from two months to five years, only one person contracted the disease, a fact which is particularly convincing with respect to protection conferred since almost every one of these individuals was either an attendant in scarlet fever wards or was present in an institutional or community epidemic.

Further study of the data shows that among 33,636 persons (see references 9, 11, 12, 15 and Table I) who were inoculated with doses and preparations not in accordance with the recommendations of the Scarlet Fever Committee, there were 163 who contracted scarlet fever during periods ranging from five weeks to five years. Moreover there was less chance of infection among these, since most of them were school children (Brokman,[11,12] Harrington[14]) who were studied at a time when no epidemic was in progress. It is noteworthy, however, in the latter group, that in spite of the inadequate methods of immunization used the incidence of scarlet fever was only one-third to one-seventh of that prevailing among the non-inoculated (based on estimated child population for controls[14]).

Table II shows the case incidence of scarlet fever in five hundred inoculated children observed during the past five years. These were checked by personal communication and by matching with the Minneapolis Health Department records.

TABLE II

Number injected	Preparation	Amount	Doses	Scarlet Fever
366	Larson's	3,000 S.T. doses	3	6 cases
64	Zingher's	250 to 2,000 S.T. doses	3-4	1 case
70	Dick's	500 to 75,000 S.T.D.	5	0 cases

Although the number of observations in Table II is too limited to draw any definite conclusions it would seem that those receiving Dick's graduated (larger) doses were perhaps afforded a somewhat greater protection.

The most exacting test of active immunization is, of course, that offered by individuals who attend scarlet fever patients. During the past six years there have been 861 persons in attendance at the Minneapolis General Hospital contagious department. Through the courtesy of Dr. Ruth Boynton, who has charge of inoculation of all Central School nurses, and with the kind help of Dr. Tuohy, Dr. Borman, Dr. Sax and Dr. Sonnesyn, who collected the scarlet fever records, I have been able to gather data concerning the incidence of the disease among these attendants (Table III).

TABLE III

861 Attendants in Contagious Department of Minneapolis General Hospital during the past six years (to May 1, 1932)

			Total number	Time observed	Contracted scarlet fever	Per cent
Group I	Known to have had no toxin.	Staff, Internes, Supervisors, Maids, Orderlies, Laboratory Workers	181	6 years	9	5.0
Group II	Some received 3 doses (9,000 S.T.D.) Larson's or 10,500 S.T.D. Dick's. Many received no toxin.	Student Nurses	601	6 years	46	7.0
Group III	Received 5 doses (110,500 S.T.D.) Dick's toxin.	Student Nurses	79	2 years	0	0

The usual case expectancy of scarlet fever among nurses in institutional experience reported elsewhere is approximately seven per cent.[1,2,10] This is confirmed by the findings in Groups I and II (Table III).

Of the forty-six student nurses who contracted scarlet fever (Table III), eight had received three doses each of Larson's toxin (9,000 S.T. D.), four had received three doses (10,500 S.T. D.) of Dick's toxin but the remaining thirty-four had not been immunized. The majority of our cases of scarlet fever among nurses, therefore, were in the non-immunized. No student nurse who has received five complete doses of Dick toxin (110,500 skin-test doses) has as yet become infected although it must be admitted that this group comprises only seventy-nine individuals and about one-half of these have not yet had the same duration of exposure as existed in Group II. All Central School student nurses are now receiving the dosage recommended by the Scarlet Fever Committee.

Among 1,200 scarlet fever patients admitted to the Minneapolis General Hospital during the past six years, sixty-one had been inoculated. Five of these had received small doses of Dick toxin whereas fifty-six had received 3,000 to 9,000 skin-test doses of ricinoleated toxin from five weeks to five years previously.

DISCUSSION

I have attempted in this study of 52,200 inoculated persons taken from the literature and from personal experience, to bring out some of the facts regarding the value of active immunization against scarlet fever based upon subsequent case incidence.

Analysis of the reported case studies to date shows clearly that small doses of toxin as first administered for the prevention of this disease were inadequate, a fact which is attested to by the occurrence of many cases of scarlet fever following their use. It would seem further that ricinoleated toxin as well as other modifications of the toxin, have not proved satisfactory in conferring immunity to scarlet fever.

The reports so far indicate that large doses of pure toxin have been effective in preventing scarlet fever. To control institutional and community epidemics, inoculations of toxin are given only to (susceptible) exposed persons whose throat cultures (on blood agar) are negative, whereas positive culture cases (those already infected or carriers) are isolated and given antitoxin if symptoms develop. In the absence of symptoms at the end of a week these passively immunized cases are then inoculated with toxin. A number of institutional epidemics apparently have been controlled promptly by this procedure.

To date scarlet fever has not been reported as occurring within four years following the administration of the dose recomemnded by the Scarlet Fever Committee.*

General reactions were noted in 10 to 20 per cent of persons after each dose of toxin, and although a few instances of a twenty-four to thirty-six hour period of rather severe toxemia were encountered, not one serious reaction could be found in over 200,000 injections of toxin even in instances where overdosage was given by mistake.

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*I. E.—500, 2,000, 8,000, 25,000, 75,000 skin test doses at intervals of one week followed two weeks later by a Dick test and an additional 100,000 S.T.D. if this is found positive.

SERUM TREATMENT

Scarlet fever streptococcic antitoxin was used rather extensively at the beginning of the century, following its introduction on the continent by Marmorek[15] and Moser.[16] It fell rather quickly into disuse and remained in obscurity until interest was revived in 1924 by the announcement of the Dicks[17] and Dochez[18] of an antiserum produced by horse immunization with the toxin of streptococcus scarlatinæ. Experiences with this form of specific therapy have since been reported by a number of observers, many in the nature of clinical impressions, a few with more elaboration as to materials, dosage, time of administration, case selection, criteria of effectiveness and controls.

In a report on 100 serum-treated cases of scarlet fever observed in 1925 I prepared a chart for the tabulation of critical data including the above mentioned factors which might help in arriving at reasonably accurate conclusions with regard to the merits of antitoxin.

A general summary of the results of serum therapy in 2,430 reported cases suggests an earlier temperature recession in the treated than in the control cases by about two days; yet an especially careful study of mean temperatures in 110 of these cases by Veldee et al[29] failed to show any superiority for the serum on the basis of febrile reduction alone. All observers agreed, however, that the duration of the eruption was less among early treated cases than was true in the untreated (an average decrease of 2.4 days). Symptom improvement in the serum-treated cases was remarked upon favorably by all, but obviously a numerical comparison with the controls could not be accurate (where noted, there was an apparent acceleration of about two days). Studies made on desquamation showed invariably that this was localized and very mild in serum-treated as compared with control cases. The influence of early administered antitoxin on the incidence of major complications was rather striking. The studies reporting these are included with averages for otitis, adenitis and nephritis in Table IV.

TABLE IV

	Otitis	Adenitis	Nephritis
1664 serum-treated cases	5.9%	3.9%	0.8%
2093 untreated controls	12.7%	11.7%	3.8%

Where arthritis and other complications were listed they were noted less frequently in the serum-treated cases than among the controls, but whether or not serum was a responsible factor could not be determined with accuracy.

Serum reactions occurred in an average of 44.9 per cent of 2,350 cases receiving antitoxin although these were admittedly negligible except in 10 per cent of the cases. In this 10 per cent group a few reactions were reported as being more severe than the disease itself. Two deaths, which it seems may be attributed to anaphylaxis, were reported, one by Banks[26] and another by Stewart[32]; the first following intravenous and the latter after intramuscular injection of the antitoxin.

At the Minneapolis General Hospital to date we have given antitoxin to approximately three hundred cases of scarlet fever, in which an early diagnosis and evidence of moderately severe toxemia warranted its use. By exercising the most extreme caution in testing for serum sensitivity we have been able to prevent serious reactions so far and our results compare favorably with those previously reported.

On the assumption that scarlet fever toxin is disseminated to a maximum rather early in the course of the disease the best method of serum administration should theoretically be the intravenous. Although this seems to be borne out by the reports of over 500 cases[25,26] so treated to date, nevertheless, it must be emphasized that serious and even fatal serum reactions can and do occur. The most rigid precautions are necessary to prevent this. A careful history, tests with diluted serum into or under the skin, and slow careful administration guided by a tourniquet and stopped if symptoms of anaphylaxis appear are exceedingly important. When these precautions are exercised, the administration of antitoxin may be beneficial if given to severely toxic patients early in the course of the disease.

COMMENT

A valid criticism of the data so far available on scarlet fever prevention and treatment is the lack of detail in the majority of individual case studies and which if given might eliminate the factor of error through chance.

Realizing this I have attempted to draw conclusions on the basis of the prevailing opinion of the most experienced observers.

CONCLUSIONS

1. A somewhat controversial tendency in regard to the value of prevention and serum treatment of scarlet fever may have resulted from improper preparations, dosage, methods and precautions previously employed.

2. A study of the reports on 52,200 persons inoculated for the prevention of scarlet fever seems to indicate that:

(a) Small doses of toxin as first administered were entirely inadequate, a fact attested to by the occurrence of many cases of scarlet fever following their use.

(b) Ricinoleated and modified forms of toxin have not as yet proved satisfactory in conferring immunity against the disease.

(c) Large doses of pure toxin as recommended by the Scarlet Fever Committee have been effective in the control of institutional and epidemic scarlet fever for as long as four years after their administration.

(d) General reactions which are sometimes distressing but never serious occur in ten to twenty per cent of persons receiving pure scarlet fever toxin.

(e) Graduated doses of pure scarlet fever toxin to the point of a negative Dick test (as outlined by the Scarlet Fever Committee) are warranted from the evidence so far available but should be given with the full knowledge that distressing but not serious reactions do occur.

3. A summary of the results in 2,430 reported cases of early uncomplicated scarlet fever in which specific streptococcus antitoxin was used shows that:

(a) Temperature recession is usually more prompt in the serum-treated cases than in control cases.

(b) The duration of the eruption is shorter in the treated than in the untreated cases.

(c) Early symptom improvement is more common in the serum-treated casees.

(d) Desquamation is milder and more localized in those who receive serum than in those who do not.

(e) Antitoxin exerts a favorable influence on the incidence of major complications.

(f) Intravenous administration of serum probably gives the most striking therapeutic results.

(g) Serum reactions are a menacing factor in about ten per cent of cases and can be the cause of death unless the most rigid precautions are employed.

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THE DIAGNOSIS AND TREATMENT OF INFECTIONS OF THE URINARY TRACT IN CHILDHOOD*

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THE diagnosis of infections of the urinary tract in childhood is usually made by examination of the urine, because in this period it is unusual for the patients to have symptoms or signs referable to the urinary tract. This absence of local symptoms has led the pediatrician to make a provisional diagnosis of pyelitis whenever he sees an acutely sick patient with high fever and absence of local symptoms. In infancy, a chill is more likely to be a symptom of onset in urinary infections than in pneumonia. The finding of pus in the urine when its vaginal or preputial origin can be excluded warrants a diagnosis of urinary infection. To avoid error in diagnosis it is advisable to obtain a catheterized specimen from all girls and from boy infants; it can be obtained from older boys after they have passed a small amount of urine with the foreskin retracted, and by catching some of the remainder in a sterile container.

I have advisedly said to rely on a catheterized specimen of urine instead of a culture of the urine because I think that the difficulty of making cultures practically excludes this procedure in general practice, but it is possible to carry a small metal catheter for the girl and a small rubber catheter for the boy and a few small glass tubes which can be boiled just before using. If lysol is not available the urethral outlet can be swabbed with sterile water and then mopped dry with absorbent cotton. A small specimen can be carried to the office and examined within four to six hours under the high power microscope. In case of infection, innumerable organisms will be seen in the field and numerous pus cells. The former may be present without the latter and are of equal significance in making a diagnosis. The members of the colon-typhoid group are most commonly the causative organisms, and this type of infection is about three times as common among girls as among boys. Tuberculosis of the kidney occurs just frequently enough so that the presence of marked pyuria with negative cultures on the ordinary culture mediums should make one suspect it. In our experience hematuria complicating sterile pyuria makes it practically certain that one is dealing with renal tuberculosis. The bacilli of tuberculosis are usually found in large numbers in the urinary sediment.

Having made a diagnosis of urinary infection, it is essential to know the organism and the state of the urinary tract. The kidneys may be involved in the infection with resultant loss of function. If any back pressure is present, it is more difficult to effect a cure.

It is necessary to make a complete examination in all cases in which recovery is not rapid under treatment. Such examination includes chemical, microscopic and bacteriologic examination of the urine. Roentgenograms of the bladder, ureters, and kidneys, estimations of the blood urea, residual urine, return of phenol red, a cystogram and, if indicated, an intravenous cystogram. If nothing is found, a period of two to three weeks intensive treatment should be tried before a cystoscopic examination, ureteral catheterization and pyelogram are made. By such complete urologic examination the presence of any abnormality of the urinary passages, which may be present in the various forms as indicated in Figure 1, is determined. Symptomatic cure and disappearance of pus from the urine is usually not difficult but sterile urine on culture after discontinuation of the treatment is the only evidence acceptable that the treatment has been successful. It is apparent that diagnosis as well as cure should be controlled by culture.

The treatment of acute pyuria in infancy and childhood consists first of an attempt to wash out the upper urinary passages as much as possible. Alkalinization of the urine has been practiced widely in addition to the administration of fluids by mouth, rectum, peritoneum, muscles, or veins. Whether alkalinization is of any value has never been definitely proved, its effect on the growth of the infecting organism is nil; a soothing effect on the inflamed mucous membrane has been assumed, but has never been proved. Clark has recently shown that patients with cystitis manifesting pain, irritability, frequency and tenesmus, are benefited by increased acidification of the urine to a pH of 5.2 and 4.8. We know that the colon bacillus grows with almost maximal intensity at the highest hydrogen-ion concentration that can be attained by alkalinization. The effect of acid reaction on the colon bacillus is very much more evident at a hydrogen-ion concentration that can be readily attained by medication. A pH of 5 can be reached in the urine with moderate doses of ammonium chloride, and although only exceptionally has an organism been found that is inhibited in its growth at this hydrogen-ion concentration, the growth is slowed considerably and cures have been reported with a urinary hydrogen-ion concentration that has not reached lower levels. The combination of large amounts of fluid and acidity of urine sufficient to inhibit bacterial growth makes an ideal combination during the acute stage to wash out the passage and prevent further growth of organisms in the urinary passages.

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*From the Section on Pediatrics, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, St. Paul, Minnesota, May 24, 1932.

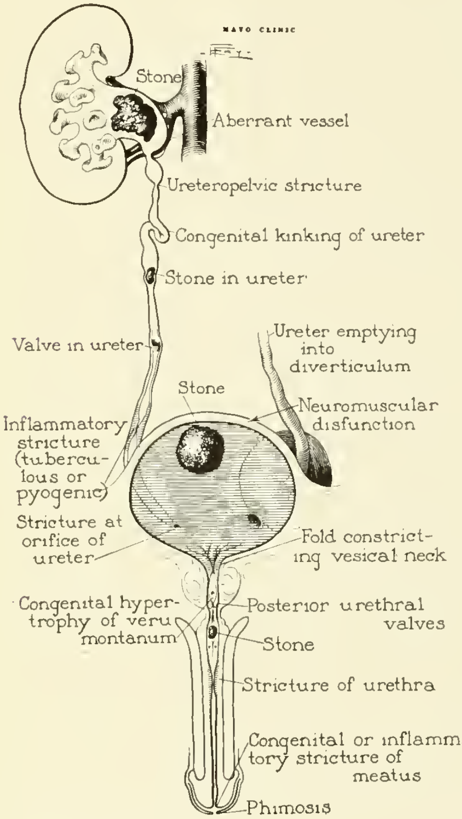
MAYO CLINIC
Stone
Aberrant vessel
Ureteropelvic stricture
Congenital kinking of ureter
Stone in ureter
Valve in ureter
Ureter emptying into diverticulum
Stone
Neuromuscular disfunction
Inflammatory stricture (tuberculous or pyogenic)
Stricture at orifice of ureter
Fold constricting vesical neck
Congenital hypertrophy of verumontanum
Posterior urethral valves
Stone
Stricture of urethra
Congenital or inflammatory stricture of meatus
Phimosis

Fig. 1. Various conditions that may give rise to urinary obstruction.

In the more chronic cases observed, experience indicates that methenamine used under controlled conditions offers better chances of success than any of the other urinary antiseptics. Gillespie recently studied the bactericidal effect of pyridium and serenium, two newly introduced urinary antiseptics, and has not been able to show that they are of any value in the treatment of colon infections. Work on the use of methenamine has shown in vitro experiments that the degree of acidity is of the utmost significance in successful treatment. Without an accurate control of urinary acidity, methenamine may be of no more use than so much water. At a pH of 6 with 0.5 per cent concentration of methenamine, not enough antiseptic power developed in urine to kill the colon bacillus after twenty-four hours, but at a pH of 5, one-tenth of this dose killed all organisms within that time period, and the same dose rendered the urine sterile in six hours. By means of methyl red paper which turns bright red at a pH of 5.5 and below, it is possible to determine whether the acidity of the urine is sufficient to split methenamine rapidly enough to produce bacteriostasis or even bacteriolysis in six to eight hours. Whether this suffices to clear up the infection, only trial will tell. If unsuccessful, it is probable that urinary stasis is present in the system, and the cause of the stasis should be determined, if possible, by complete urologic examination.

In treatment with methenamine the urine is rendered sufficiently acid to turn methyl red paper by the use of increasing doses of ammonium chloride (enteric coated tablets), starting with from 5 to 15 grains four times a day depending on the age of the child. Then methenamine is given in initial doses from 2 to 5 grains four times a day every six hours. After three days the urine is cultured and if after twenty-four hours the plate is sterile, the drug is continued three days longer and the urine is again cultured. If it is again sterile the drug is discontinued and after three days the urine is again cultured. If sterile, the culture is again taken in three days and if again sterile it is evident that the infection has been overcome. If with the first dosage the urine is not sterile, the methenamine is increased 2 to 5 grains for a period of three days and cultures made and the treatment with increased dosage repeated as mentioned. If the urine does not became sterile the dose is increased again by the same amount until either the cultures become sterile or irritation of bladder and hematuria sets in and treatment has to be discontinued temporarily. A patient should not be dismissed as cured until two negative cultures have been obtained after medication is discontinued.

In the last ten months we have been using the ketogenic diet at The Mayo Clinic for the treatment of urinary infections of children with excellent results. In a study of such urine, it was found that most specimens of ketonurine* with a pH below 5.6 had definite bactericidal power. Exceptionally urine in the pH range from 5.2 to 5.6 did not have this power and that above 5.7, in spite of a strong diacetic acid test, has no antiseptic effect. Further study showed that the bactericidal effect was not due to the low pH as such, to the presence of diacetic acid or sodium diacetate. The bactericidal action of the ketonurine is probably due to acidity below pH 5.5 in synergy with substances in the urine hitherto not determined. It is hoped that in the future it will be possible to simplify the diet so as to make it more generally applicable. At present it is almost essential to have a dietitian available for the working out of the diet. The patient is given about 50 calories for each kilogram of body weight and 1 gm. of protein for each kilogram. For a child weighing 30 kg., the diet starts with 30 gm. (120 calories) of protein, 70 gm. (280 calories) of carbohydrate, and the remainder up to 1,500 calories in fat (120). The second day the carbohydrate is reduced to 50 gm. and the fat is correspondingly increased; the third day only 30 gm. carbohydrate is given, with a further increase in fat to match the calories; the fourth day only 20 gm.; the fifth 15 gm., and the sixth 10 gm. are given. This is usually sufficient to insure ketosis as indicated by a strongly positive diacetic acid test, and in most instances a pH well below 5.5. If the hydrogen-ion concentration does not fall below 5.6 or again rises above 5.5, the addition of 1 to 3 gm. of ammonium chloride a day will reduce the hydrogen-ion concentration to the desired range. This should result in sterilization of the urine in from five to ten days.

By means of the diet the condition in eight of nine cases of urinary infection was cleared. In three of the cases major urinary anomalies were associated with retention. Table 1 contains the details of the six cases in which urinary anomalies were not present. The single failure was in the case of a boy with hypospadia and infection due to Proteus vulgaris. Here as long as the pH was 5.6 there was marked reduction of the number of organisms in the urine to 400 and 100 for each 0.5 c.c. of urine. When the pH rose to 6.1

TABLE 1. PATIENTS WITHOUT ANOMALIES TREATED WITH KETOGENIC DIET

Age, years	Type of organism	Pus in urine, grade	Days on diet	Interval between first ketosis and and sterilization of urine, days	Days after stopping diet urine culture sterile	Relapse	Comment
10	Colon bacillus	3	10	6	4	+	Streptococcus lactis cultured during relapse
12	Colon bacillus	4	23	6	5	0	
9	Colon bacillus	4	33	?	20	0	
10	Colon bacillus	4	12	8	23	0	
13	Staphylococci	4	22	6	14	0	
8	Proteus vulgaris	4	14			0	Third day of ketosis pH 5.6, 400 organisms per 0.5 c.c. Fifth day of ketosis pH 5.6, 100 organisms per 0.5 c.c. Eighth day of ketosis pH 6.1, innumerable organisms per 0.5 c.c.

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*Condition of the urine after the administration of a ketogenic diet.

TABLE 2. DIET IN CASE 3.

		Grams						
	Date	Carbohydrate	Protein	Fat	Diacetic acid	Urine pH	Bacteria in 0.5 c.c. of urine	Pus, graded
Hydronephrosis (girl, aged seven years)	12-12-31	65	26	100	None		Innumerable	4
	12-16-31	15	26	140	+	5.0	Innumerable	2
	12-17-31	15	26	140	++	5.3	100	2
	12-18-31	15	26	140	+++	5.3	200	1
	12-21-31	15	26	155	+++	5.3	None	Occasional
	12-24-31	20	30	170	+++	5.2	None	Occasional
	12-26-31	45	30	150	None	5.5	None	
	12-28-31	85	35	100	None	8.4	None	Occasional
	12-30-31	85	35	100	None	8.0	None	

the organisms again became innumerable in 0.5 c.c. At the time this patient was treated, the significance of a low hydrogen-ion concentration was not fully appreciated. Two patients became reinfected, but both with a different organism. Short abstracts of the three cases of urinary anomalies follow:

Case 1.—A child, aged eight years, had had chronic infection of the urinary tract for an unknown period. Albuminuria and pus were both graded 1. Innumerable Gram-negative bacilli were found on culture. The concentration of urea was 24 mg. in each 100 c.c. of blood and the phenolsulphonphthalein test gave a return of 55 per cent. The cystogram did not show reflux into ureters. Left renal colic was present. Intravenous urogram revealed dilatation graded 3 of the left pelvis and calices; medium was not shown in any film in ureter below ureteropelvic juncture. Urine was found sterile on culture after five days of the diet.

Case 2.—A child, aged nine years, had had pyelitis three years ago. Cystoscopic ureteral catheterization had been done with improvement. Definite cure had not been obtained. June, 1931, there was recurrence of pain and fever, with pus in the urine graded 4. Examination disclosed albuminuria graded 2, and pyuria graded 4. Cultures of urine from the bladder and ureters showed innumerable hemolytic streptococci. Roentgenologic examination of the kidneys and bladder was negative. The concentration of urea was 22 mg. in each 100 c.c. of blood; the phenolsulphonphthalein test gave a 50 per cent return. Cystoscopic examination showed diffuse cystitis, bilateral pyelonephritis, bilateral hydronephrosis and hydro-ureter with probable duplication of ureter on the left side. The tuberculin test was negative. Culture of urine was sterile five days after the patient was placed on the diet.

Case 3.—A child, aged seven years, had had pyuria with fever to 105° F. and pain in the right side since December, 1930. April, 1931, cystoscopic examination was done. Infected hydronephrosis was diagnosed. July, 1931, the right ureter was dilated. Nephrectomy was considered. A severe attack occurred in October with a massive amount of pus in the urine. November, 1931, hydronephrosis with probable obstruction at the uretero-pelvic juncture was diagnosed. The phenolsulphonphthalein return was 50 per cent in two hours. The concentration of urea was 28 mg. in each 100 c.c. of blood. November 24, 1931, right nephropexy and temporary nephrostomy were performed. The patient was returned to medical service for dismissal December 12, 1931. The urine contained pus graded 4 and innumerable colon bacilli. The patient was placed on the diet, and the infection cleared in ten days (Table 2).

SUMMARY

Acidification of the urine in acute pyelitis should add to the efficacy of large amounts of fluids in washing the urinary tract free from infectious material.

Methenamine in combination with ammonium chloride to acidify the urine to a pH of 5.5 or less has proved superior to any of the other urinary antiseptics I have used.

By the use of the ketogenic diet the urine can usually be rendered bactericidal when the pH is below 5.5. Ketonurine of pH of 5.5 is an excellent antiseptic for clearing up urinary infections and ketonuria should prove useful in the preparation of patients for operation on the urinary tract as well as in their postoperative treatment.

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SIMPLIFIED INFANT FEEDING*

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SCIENTIFIC infant feeding is of comparatively recent origin. The first definite progress was noted in the middle of the last century. It was that period that witnessed the remarkable acceleration in medical research and rapid acquisition of authentic knowledge which so favorably influenced other branches of our profession. The child had already been recognized as an asset. The enormous infant mortality from nutritional disorders demanded attention. Attempts, more or less empirical, to improve existing feeding conditions, produced some favorable results. Advances in this particular branch of pediatrics came spasmodically, alternating with periods of almost complete stagnation, due to the pronounced tendency of physicians to follow some particular school. The dogmatic teachings of an individual whose work seemed to carry an authentic finality would be followed until a new leader appeared. Recently our progress has developed in a more orderly manner. We have acquired some information as to normal growth and development. We have some idea as to how far an infant may deviate from the average and still be normal. The effects of the quantity and quality of food on development and health are being solved through the accumulation of accurate observations. This with advances in physiology, chemistry and allied sciences has contributed materially to our knowledge of infant feeding.

BREAST FEEDING

The simplest method of infant feeding and unquestionably the best is that of maternal nursing. Mothers still want to nurse their babies and the majority can do so either exclusively or in part if properly advised.

The actual contra-indications for maternal nursing are few, the most positive being active tuberculosis in the mother, prolonged infections such as typhoid, nephritis with uremic tendencies and general debility from cancer or other causes. Temporary weaning may be necessary because of operations on the mother and acute infections, but very few nursings need be omitted under such conditions. If pregnancy occurs, gradual weaning of the baby is advisable.

Failures in maternal nursing appearing in the first few weeks are ascribed to numerous causes. Even a casual analysis of these forces one to the opinion that most could have been avoided had there been adequate supervision.

In a recent survey of the charts of infants leaving our Duluth hospitals on artificial food, the specific reason for weaning is not always given. One may infer, however, that conditions formerly regarded as sufficient, such as fissured nipples, mastitis and even retracted nipples are being controlled and rarely constitute adequate cause for weaning. Colic and vomiting have yielded to more recently developed treatments, among which is the use of phenobarbital. Abnormal stools do not appear to excite the apprehension formerly encountered. The most frequent cause of weaning appears to be a failure to gain in weight because of insufficient breast milk. If maternal nursing is to be increased it is evident that more consideration must be given to the development of an adequate supply of breast milk.

The production of breast milk depends largely upon the stimulation of the breasts by the sucking of the baby. The best results are obtained by putting the baby to the breast after the sucking reflex is fully developed. It is unfavorably altered by too early nursing. The reflex does not develop fully under twenty-four hours and may be delayed beyond that period. Hamberger believes that the maximum development is reached on the third day. Definite signs of this development are spontaneous sucking movements, restlessness and crying. The crying is not to be confused with that occurring immediately after birth. If these facts are recognized and a proper routine established, the initial weight loss following birth will be less and the birth weight will be more quickly regained.

The optimum interval between nursing varies with the individual. Usually infants do best on a four hour schedule. Some infants do fully as well or better on a three hour schedule.

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*From the Department of Pediatrics, the Duluth Clinic, Duluth. Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 24, 1932.

COMPLEMENTAL FEEDING

Complemental feeding may be necessary. That the necessity really exists should be accurately determined. The efforts of maternity ward supervisors to establish a satisfactory weight curve and the indifference of the physician as to the methods of accomplishing this too frequently determine the addition of a complemental food. Care must be taken that the baby does not get this until all known methods of increasing the mother's milk supply have been exhausted. The addition of artificial food at too early a period will frequently result in an inadequate stimulation of the breasts. The baby must make an effort to get the complemental food and the amount offered should not be sufficient to result in a decreased appetite for the next nursing.

Unfavorable results with an adequate breast milk supply will usually be found by a careful physical examination of the baby. Atelectasis, congenital heart, cerebral hemorrhage, malformation, prematurity, general debility and intercurrent infections are frequent causes of failure to gain. Under all such conditions the baby has a better chance on breast milk than it would have on any other food.

ARTIFICIAL FEEDING

The rapid advances in the sciences contributing to our knowledge of infant feeding were followed by many attempts to make this knowledge not only available but practical. Many systems or methods of infant feeding have been developed. Some of these are comparatively simple. Others, while more complicated and requiring special technic, are equally efficacious. Still others seemingly inspired by commercial interests have less to recommend them.

Before any method of artificial feeding can be used intelligently a knowledge of the fundamentals is necessary. This includes a knowledge of the theory, a familiarity with the various components of milk, the quantities of each desirable, the caloric requirements of the infant and some facts regarding the digestion, absorption and assimilation of food. A familiarity with the symptoms arising from an excess of a component such as sugar or fat is essential. With this background the physician is still without a method of approach to an individual feeding problem until he becomes familiar with one of the many methods available. A thorough familiarity with one method is sufficient. Frequently the physician knows too many methods and believes that it does not matter which one is used. It may not matter what method is followed, provided the physician in addition to his mastery of the fundamentals has acquired the art of infant feeding through experience. He is occasionally lacking in the latter and so changes from one method to another if the infant fails to gain, and not infrequently the results are disastrous.

Attempts to accurately evaluate the different methods of infant feeding that have been followed or are still popular is difficult. Most systems have been developed to meet certain requirements. Nearly all have made some definite contribution to our knowledge.

The first methods widely used in this country were those of Budin, and Rotch and Holt. The latter, while popular, was particularly dogmatic and complicated for one who was not a mathematician. As we look back now it seems absurd to think that changing a food element a small fraction of one per cent could favorably influence a child's progress. The greatest contribution of these men was their teaching of the necessity of fitting the food to the child.

The complicated system of Rotch and Holt was followed by the German method of simple dilutions of milk with sugar water, sometimes erroneously called the caloric method. Czerny popularized the Holland buttermilk mixture, which was useful where fat intolerance existed. Still later appeared the lactic acid formulas of Marriott and the Czerny-Kleinsmit butter-flour mixture. Both of these are excellent. They have contributed materially to our knowledge of infant feeding and may be used with remarkable results. Simpler methods may be employed.

Foods synthetically prepared to simulate breast milk have some advantages. They may be used satisfactorily over long periods of time. A difficulty which occasionally arises is due to their inflexibility. It is impossible to modify them. The demands of an infant for increased carbohydrate cannot be met without increasing the entire food or by making additions.

Competent observers have given excellent reports on the use of unsweetened evaporated and dried milk preparations. Observations on the later physical and mental development of infants fed on different types of these foods indicate that the ultimate results with fresh cow's milk are better. In communities where a satisfactory fresh milk is not available, these milks deserve more consideration than other prepared foods.

The unsweetened condensed milk must not be confused with the sweetened variety. The composition of the latter is such that it is impossible to produce a balanced diet by the simple addition of water. When diluted sufficiently to bring the carbohydrates down to the amount which experience has shown to produce the best results, the proportions of the other components are too low. While they may be useful for a short period they should not be used for any length of time.

In addition to these, the market has been flooded during the past few years with a large variety of canned foods. The list includes among others such food as malted milks, milk modifiers and some simply calculated to increase the carbohydrate of the food. Some manufacturers appear to think it is their function to not only give full directions to the mother but also to educate the physician in the science of infant feeding. Conflicting claims lead to confusion and frequently to rapid changes from one widely advertised food to another with disastrous results to the infant. Some of these foods may be used but they are unnecessary. Certainly the multiplicity of canned foods is out of all proportion to their value.

The clinical work of most physicians of wide experience is that the best results can be obtained in the normal infant with diluted cow's milk to which carbohydrate is added.

SIMPLE MILK MIXTURES

In the use of simple milk mixtures it is first necessary to determine the amount of food required. This may be calculated in terms of calories per pound, always using the expected weight for the age. In general, the requirements vary with the weight and age of the infant. A very young poorly nourished baby will require more food per pound than an older well nourished one. If the food requirements are calculated in calories per pound the first baby will need approximately 60 calories per pound while the older well nourished one will require only 40 calories. In all cases the figures are only approximate and may have to be corrected after a few days of observation. Milk and sugar will supply the calories. Roughly speaking, each ounce of milk contains 20 calories and each ounce of carbohydrate 120 calories.

The infant's requirements for the different components are easily met by a simple dilution of cow's milk. The essential protein requirements for the maintenance of life and the promotion of proper growth are contained in 1.5 to 2 ounces of milk per pound per day. The fat requirements are also contained in that amount of milk. One and one-half ounces of cow's milk will furnish sufficient mineral constituents to meet the baby's demand, with the possible exception of iron. The amount of carbohydrates required is equally easy to determine. Breast-fed babies get about 5.5 grams of sugar per pound of body weight or approximately 1 per cent of their weight. Cow's milk contains 4.75 per cent of sugar. It is therefore easy to estimate the amount of additional carbohydrate necessary. It is practically always safe to add 5 per cent of additional sugar and many babies will tolerate 10 per cent or more. The water requirements vary with the activity of the child, surrounding temperatures, frequency and consistency of the stools and vomiting. About 10 per cent of the body weight will meet all demands for water under normal conditions.

The fat-soluble Vitamins A and D must be added to the diet. Both are contained in cod liver oil. There is not sufficient Vitamin C in cow's milk to protect the infant from scurvy and that small amount is probably injured by boiling. This vitamin must be added. Orange or tomato juice will furnish it.

The choice of carbohydrates is not difficult. Theoretically lactose, the sugar of both human and cow's milk, should possess some advantages. Practically it is rarely used as large amounts tend to produce diarrhea. Because of its slow digestion and absorption, it reaches the lower portion of the digestive tract where fermentation gives rise to gas formation and hence increased peristalsis with frequency of stools. This property of lactose may indicate its use in children with a tendency towards constipation. It is more expensive than other sugars.

Cane or beet sugar is less expensive and is always available in the household. It will meet the requirements of most infants as it is quickly digested and absorbed from the intestinal tract. It is not as laxative as milk sugar, consequently larger amounts can be used. It is the sweetest of the sugars available for infant feeding. Large quantities are not advisable as it may lead the infant to demand highly sweetened foods.

Mixed sugars containing dextrin and maltose are excellent. They are derived from starch which has been subjected to the action of malt diastaste or heat, especially in the presence of acid. The composition depends upon the length of time that the processes of conversion are allowed to proceed. If only for a short time there will be relatively large amounts of dextrin. If for a longer period, there will be more maltose and some dextrose. The mixtures of several sugars is of distinct advantage in that large quantities can be fed without producing signs of carbohydrate intolerance such as excessive gas formation, diarrhea or irritated buttocks. The advantage is due to the fact that where mixtures of carbohydrates are fed only certain of the component sugars may be fermented and consequently excessive gas formation at one time is not likely to occur. This is particularly true when dextrin, maltose and dextrose are added to a mixture which already contains lactose. There are several such sugars available in powdered or liquid form. Corn syrup belongs to this class of carbohydrates. It is the least expensive.

The use of such simple combinations of milk, sugar and water avoids the necessity of elaborate instructions for the mother. She need only be told to add the measured amount of carbohydrate to definite quantities of milk and water and boil. The mixture is divided into bottles representing the number of daily feedings. It should be kept cold until used.

The use of these simple milk mixtures is advocated. They will not solve all of the feeding problems that arise in the normal healthy infant. There are always enough questions arising to keep the physician from leading a monotonous existence. These milk mixtures are recommended because they are simple, inexpensive, require few additions, are most flexible and contain fewer possibilities for error with consequent harmful results.

DISCUSSION ON SYMPOSIUM ON PEDIATRICS

Dr. Thomas Myers (St. Paul): Much of the more recent work on epilepsy has been done by Minnesota men, and the only real advances in knowledge of the pathology and therapy of epilepsy of late years may be ascribed to Dr. McQuarrie, of the state University, and to Drs. Helmholz and Peterman at Rochester. They have demonstrated that this condition, so long a bugbear of medicine, is apparently a result of imbalance of the delicate and complex interrelationships existing between the components of brain cells. This refers particularly to the balance between cholesterol and lecithin, between sodium and potassium, and the proportion of water to solids, in the brain tissues. Disturbances of the normal equilibrium of these elements have been shown to be vitally associated with those explosive attacks which characterize the epileptic patient. Dr. McQuarrie has shown that by increasing the water dilution in the brain cells, seizures become more frequent, showing increased permeability of their cell membranes, permitting an increased inflow of water, with a corresponding loss of potassium as well as a disturbance of cholesterol content. Why some cases respond so well to dehydration treatment, while others are influenced by the ketogenic diet, and still others show response to neither type of attack, is still a mystery. Some attribute the success of the ketogenic diet largely to its small fluid intake. On the other hand, it has been demonstrated by Wilder and others that aceto-acetic acid, as well as its sodium salt, which are formed as a result of the ketogenic diet, have a definite sedative effect in epileptic convulsions.

The difficulty in applying diets based upon dehydration, fasting or high fat content, upon children, has made their use, outside of hospital practice, frequently impossible. It is to be hoped that the near future may reveal a method of application which may be used in a practicable manner.

Dr. Rowe has ably portrayed the advance made in infant feeding in recent decades. The greatest reduction in mortality has occurred in infancy and childhood, and this is in large part due to improvements in methods of infant feeding, as well as prophylaxis against the many ailments which formerly took such heavy toll in the early years of life. The past twenty years show a 50 per cent decrease in deaths resulting from malnutrition, improper feeding, enteritis, and similar disturbances. This is due to the teaching of simplified infant feeding to the physicians and laity; to the practice of maintaining breast feeding; to the improvement in handling cow's milk, which through boiling, pasteurization and adequate dairy sanitation has provided clean, uninfected milk to babies. Properly supervised tuberculin testing in cattle has almost completely eliminated the transmission of bovine tuberculosis via the milk, and pasteurization or boiling of milk completes the safeguards. As a result of these measures, pediatric practice is, to only a small degree, now concerned with nutritional disturbances or to intestinal infections.

The feeding of the newborn, often a neglected matter, can bear very positive improvement frequently. It is possible to reduce considerably the so-called physiologic weight loss of the first week, with its commonly attendant dehydration and fever, by giving complemental bottle feedings until the breast milk is adequate, and by offering the baby the breasts as early as the mother's condition permits. The practice of giving only one breast at a feeding, and only five occasions daily, often leads to delay in stimulating breast secretion, and in my experience can bear correction in many cases.

The ability of the normal infant to tolerate and digest solid food at an early date has been frequently underestimated. Nearly all infants are the better for offering cereal at the third month, and vegetables at five months. Such additions to the diet give the baby a more solid bony and muscular structure, and help to prevent rickets, anemia, and similar disturbances.

Dr. Ray Shannon (St. Paul): I think that we are exceedingly fortunate this afternoon in the committee's choice of speakers and subjects for this pediatric symposium. It would be difficult to imagine a more fortunate combination of the interesting with the practical than we have heard.

The subject of epilepsy has ever been a challenge to the medical profession. Little can properly be added to what Dr. McQuarrie has said. It is perhaps not impertinent to reemphasize a few points that seem to me to be important.

1. The classification of "essential epilepsy" is, like the old term rheumatism, becoming more limited as time goes on. Aside from the various organic brain lesions which have so frequently been diagnosed with these cases in the past, a number of so-called functional conditions that are capable of producing seizures that may well be confused with essential epilepsy are now possible of recognition and are amenable to a separate therapy. I refer to allergic disease, calcium deficiency and spontaneous hypoglycemia. No case should be classified as an epileptic until a most exhaustive search has failed to reveal either obscure organic disease of the brain, or any of these other conditions. It is to be hoped that time will still further limit the class of the essential epilepsies by permitting a further weeding out of other at present obscure metabolic irregularities.

2. While technical difficulties in application, if nothing more, stand in the way of success beyond a certain irreducible minimum, the type of thing that Dr. McQuarrie is doing represents the greatest advance that has yet been accomplished in the control of epilepsy. This is true for two reasons as I see it. In the first place it is not a form of treatment that is to supplant any previously recognized therapy, but may be used as an ally of any such measures. Secondly, while apparently arising in the beginning out of the field of empiricism, it seems to point forward toward the light of scientific understanding. After all, convulsions, regardless of type, are too similar in character for one to admit an essential cause as varied as the conditions under which they occur. It is much more reasonable to believe that some explosive upset in equilibrium or function within the cellular structure of the brain has occurred, and that this upset may occur in a large variety of general pathological conditions. It would seem to me that Dr. McQuarrie's work derives its greatest significance from the fact that it seems to lead toward an explanation of what this cerebrocellular explosion actually is. When he, or those who follow him, tell us what this is they will have gone far, not only in the solution of the problem of essential epilepsy, but also in the problem of the convulsive disorders in general.

I am sure that a paper such as Dr. Platou's is most opportune. The two questions of vaccination against and serum treatment for scarlet fever have been before the public mind sufficiently long so that an appraisal such as Dr. Platou has made may properly be undertaken.

From his figures there seems to be little doubt concerning the value of vaccination, properly carried out, with the naked toxin. A figure of 100 per cent efficiency seems too good to be true, and yet the variety of sources from which the figures were derived would seem actually to substantiate this almost unbelievable standard of efficiency. It dwarfs into insignificance any other of the extensively used methods of active immunization.

And yet, in spite of this remarkable record, I do not believe that the solution of the problem of scarlet fever lies in this method of vaccination. A 10 to 20 per cent of sharp reaction, even though such reactions *never* lead to serious consequences, will alone preclude the possibility of any such extensive use of this measure as, for example, may be attained with vaccination against diphtheria. Even the number of injections, five, will be a potent deterrent to a large number of the laity. From the standpoint of the medical man the very efficiency of the serum treatment will be a factor which will swing him away from the stand of imposing the penalty of vaccination upon his patients toward that of taking a chance on their getting the disease and using the serum if advisable. It is my firm belief that the ultimate solution to the problem of scarlet fever vaccination lies in the use of some form of modified toxin, such as a toxoid or a ricinoleated toxin, or perhaps in the ingestion of the naked toxin as more recently reported on by the Dicks.

At present Dr. Platou's practice is proper.

Concerning the serum treatment of scarlet fever, here again the conscientious physician must frequently pause and consider seriously the possibilities. There would seem to be no question as to the value of antitoxin given early in scarlet fever. While its value in preventing the late complications of the disease is less than in cutting short the primary toxemia it would seem that there can be no doubt that even the complications are reduced by the early routine use of serum. Had we only scarlet fever to consider we could use the antitoxin freely with a clear conscience. But we have *not* only scarlet fever to think of. We must keep in mind the possibility of a future diphtheria, or tetanus, or epidemic meningitis or any of many other diseases which may call for the use of a horse serum, the way the present trend is going, to consider. The unnecessary use of a serum now may hinder the very necessary use of a serum at some future time because of an induced sensitization. A mild scarlet fever is frequently no worse than a mild sore throat. In the general run of cases such scarlet fever does not give rise to the severe complications. We cannot afford to waste our sensitizing injection of serum on such cases. I therefore believe that until we know more about allergy, and are better capable of coping with serum disease in all of its ramifications, we perform our function better as physicians if we reserve our serum treatment for other than the mild cases. Dr. Helmholz has presented something so new that it is not possible for me to discuss it intelligently. I have had no experience with it.

It would seem that its greatest application should be in the chronic forms of infections of the urinary tract, especially stasis. The acute forms are frequently of such short duration in children that its use here might not be so apt. This very mechanism may be an important factor in the rapid clearing of many of the acute cases. And it has been always a strenuous effort in therapy to prevent ketosis in the presence of fever by the giving of carbohydrate.

Dr. C. A. Scherer (Duluth): I would just like a moment to add a few words to Dr. Rowe's paper.

In the first place, concerning simplicity of infant feeding. I am inclined to think simplicity is rather a question of years of experience. In an exact science it is possible to develop formulas and equations and figure out absolute scientific facts, but I think when it comes to an art, the mastery of years of experience is of a good deal more value, and I hope physicians feeding infants won't take this simplicity too much to heart.

Dr. Rowe brought out one thing in which I have been greatly interested, and that is the time of the application of the newborn to the breast. Dr. Oeljen in St. Luke's Hospital in Duluth took this matter up. Very fortunately we had our two hospitals, in one of which the infants were put to breast fourteen hours after birth, and in the other twenty-seven hours after birth. Dr. Oeljen selected 200 charts in each hospital, analyzed them very thoroughly, and the results were quite definite.

The work is based on the reports of Willkomm and Hamburger of Dortmund and Reiprich of Cologne. They showed very definitely that the infant should not be put to breast under any circumstances until he was ready to go to breast. Hamburger suggested that the premature stimulation of the sucking reflex not only harms the baby but also deprives the mother of her time of rest, and that premature stimulation probably exhausts the sucking reflex. Therefore, he gave the child a twenty-four to forty hour rest, giving an opportunity to heal out the thirty-five per cent of injuries to the falx and the tentorium that are found postmortem but not clinically.

Dr. Olejen's figures show that the amount of breast milk received by the infant put to the breast after twenty-eight hours was smaller for the first two days than that received by the baby put to the breast in twelve hours. But the ten day total amount for the twenty-eight-hour baby was about forty grams per day greater than the ten day total received by the baby put to the breast at fourteen hours.

We also found that our discharge ratio in the fourteen-hour group was about thirty-nine per cent under birth weight, whereas in the twenty-eight-hour group only about twenty-two per cent were discharged under birth weight. The continuation of nursing we were not able to follow up, but the general trend of the investigation showed definitely that the twenty-four hours of rest given both the mother and the child was of great advantage to the production of breast milk and to the nursing ability of the infant. The nurses also reported—and this agrees with the findings of Hamburger and Willkomm—that there was not nearly the difficulty of teaching the child to nurse when put to the breast after it had wakened thoroughly and showed an inclination to nurse as there was when the infant was forcibly awakened and put to the breast before it was time.

BLOOD DISTURBANCES AND THROMBOGENESIS FROM CLINICAL INTRAVENOUS INJECTIONS OF DEXTROSE SOLUTIONS

In intravenous medication, more attention is often devoted to the details of technic of the injection than to the changes which may occur in the blood and in important physiologic functions following such administration. More important than such technical accessories is the important fact that agents, drugs or solutions so injected act as foreign agents in the blood stream. Recently reported results of intravenous dextrose solutions are timely, and worthy of the attention of all physicians who practice such injections. The most constant change which was reported was an acceleration of blood coagulation. Other changes were increases in glycolysis and of lactic acid, also variations in mineral content, disturbed albumin-globulin ratio with increase in thrombocytes associated with a decrease in their electrical charges, and agglutination of platelets. The reported results merit serious thought. Reports of deaths from intravenous dextrose injections have been published. In contrast to the experimental and clinical evidence cited is the commercial propaganda disseminated through the organs of proprietary manufacturers who advocate and exploit all sorts of substances and solutions for intravenous injection. It is unfortunate that credulous and uncritical physicians accept these claims and thoughtlessly jeopardize the lives of their patients. (Jour. A. M. A., December 12, 1931, p. 1800.)

CASE REPORT

ACUTE EPIDEMIC ENCEPHALITIS*

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Epidemic encephalitis in its various forms may simulate almost any of the sudden affections of the central nervous system. Some of its forms may readily be recognized by its own clinical manifestations rather than differentiation by exclusion of other diseases of the central nervous system. The sudden onset of a diplopia, followed shortly by headache, a low grade and irregular fever, with lethargy and asthenia, makes an easily recognized picture. The asthenia out of proportion to the fever and lethargy are prominent findings of this condition. The mental condition in these patients may change rather abruptly for either the better or the worse and just as suddenly return to its former state. In twenty per cent of cases the onset is insidious and slow, and, in addition to the aforementioned symptoms, there may be present at the onset any of the mental and nerve symptoms. Then there are others whose onset is similar to a cerebral hemorrhage.

Following is a case report of a woman twenty-five years of age, who on December 18, 1929, came in complaining of a shooting type of pain in her left hip and right ankle and of inability to sleep. She stated that the trouble started the first Monday in November when she had a pain in her right shoulder and arm, which lasted for one week. Two weeks later her right ankle became painful and she was still unable to sleep. One week later, the left hip became painful, which persisted. From that time on the patient considered herself gradually getting worse.

This patient's past history records that when quite young she had a pneumonia, complicated with an empyema which was drained. In the summer of 1929, she stated that her head ached severely and that at times she would see black spots before her eyes. She further stated that towards evening things would seem double. Her husband stated that in late summer and early fall, when spoken to she hesitated in answering.

The physical examination revealed a white female twenty-five years of age, weighing 135 pounds, well nourished and developed, who appeared to be in some pain. Blood pressure was 126/84. Inspection of the head showed the eyes sensitive to light, the pupils dilated but reacting readily to light and accommodation. There was an obliteration of the naso-labial folds. The muscular action was equal upon both sides of the face. The skin of the face had a pallor and was somewhat shiny. The teeth were in good condition; the tongue dry and coated and the pharynx was negative. Examination of the neck demonstrated no rigidity or palpable adenopathy. Brudzinski sign was negative. The chest gave no particular findings except an increased heart rate of 100 beats per minute. The reflexes were brisk in all quadrants of the abdomen. The reflexes of the upper extremities were increased. In the lower extremities the left sciatic nerve region was tender, which did not seem to be related to motion of th part. The patellar reflexes were both brisk, with a suggestive Babinski on the left. Rhomberg's sign was negative.

After being put at absolute rest in bed in the hospital, and after the application of heat to the left leg, the pain disappeared. The mask-like facial expression and scanning speech then became more noticeable. The third day the patient was quite drowsy and her headache worse. A lumbar puncture was made, and clear spinal fluid obtained under moderate pressure, giving a positive globulin test and twenty-two cells per cubic millimeter. The University laboratory reported acute epidemic encephalitis upon guinea pig inoculation. A course of eight intravenous injections of 0.5 per cent neutral acriflavine was given. The patient claimed relief the morning following the first injection of acriflavine. The improvement was marked and she was allowed to return home on the completion of the course. The reflexes at this time were brisk and the left foot had a suggestive Babinski sign.

During the first two weeks at home the progress of the patient was satisfactory. After this period she started to complain of headache and a heavy feeling in the left side of her head. Her temperature at this time was quite irregular. Her relatives requested consultation and the patient reported to Dr. W. H. Hengstler on February 6, 1930, who advised the further use of eight daily doses of 0.5 per cent neutral acriflavine intravenously. After this course of treatment the patient felt fine and gained sixteen pounds in weight during the next three months.

From July 27, 1930, the patient complained of many headaches, especially after reading or sewing. It was found that she had lost five pounds in weight. She was given a course of salicylates and seemed to gain some relief for a short time. From this time until September 12, 1930, the patient's temperature was quite irregular, there was a progressive loss of weight, and the headaches came more often. Another course of acriflavine was given without relief of symptoms. Further consultation was requested. Dr. Moersch then saw the patient at the Mayo Clinic and made the statement that the central nervous system was now devoid of findings. The mental attitude of the patient was better from that time.

The patient has been doing very nicely and was seen January 9, 1932, when two months pregnant. On April 7, 1932, she delivered a markedly macerated fetus. In spite of some elevation of temperature during the early puerperium, after three weeks of rest in bed she was apparently again normal.

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*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 25, 1932.

PRESIDENT'S LETTER

IT IS to the credit of medicine that it has no secrets. Progress and advances are reported at once, sometimes, unfortunately, before being fully proved, and are made available to all members of the profession. Patents are taboo unless, as in the case of insulin, they are taken out in the name of a university and the profits, if any, are used for the advancement of medicine and thus for the benefit of mankind. The chances are that all the originator of any new procedure in surgery, of any new method of diagnosis or treatment in internal medicine, or of any new hormone will get, is the distinction accorded him by his confreres, and the credit of priority in medical literature. In the case of Banting, of Toronto, who discovered insulin, a proud and grateful government gave recognition in a more substantial although modest form.

In few other lines of endeavor is there such a free and enthusiastic recognition by their confreres of the efforts of those who strive for eminence in their work. Such a spirit is priceless and should be fostered. One often hears the remark that there are too many medical meetings, that there are too many medical journals, and that there are far too many articles written, and that some method should be devised to limit all this. It would seem that the medical profession, along with other lines, suffers from overproduction in most of its activities. We are also informed that there are too many doctors of medicine and that something must be done to limit the production. There is much truth in all these criticisms, but the solution of the problem is not so simple. Perhaps the real answer will be decided by economics.

Minnesota has long stood in the vanguard of medicine, due to the ambitious, eager, and enthusiastic type of members in our state society. From the early days medical meetings have been enthusiastically attended. The stimulation of contact with friends who are in the same line of work, bringing with it exchange of experiences and the opportunity of listening to words of wisdom from those who have toiled long and earnestly, all go to make medical meetings one of the most valuable means we have to keep up general interest, and to furnish a stimulus to progress. Not least of the advantages, by any means, are family friendships that result when wives of the members are taken to these meetings.

In September, the Southern Minnesota Medical Association and the Northern Minnesota Medical Association each held its annual meeting. These two societies have a definite and useful field. With but a day or a day and a half for the meeting, little time is lost by those who attend, especially in these days of splendid highways and modern motor cars. The programs of these associations are devoted to scientific medicine. The economic phase, which looks so troublesome, is left to the state association to worry over, and the members enjoy, in their full, discussions of the everyday problems of practice. For such societies as these to liquidate would be a great loss. Ups and downs in their existence will occur, but the organizations should be supported and their function maintained.

The Southern Minnesota Medical Association, as it exists today, is the result of amalgamation of the old Southern Minnesota and the Minnesota Valley societies. The Northern Minnesota Medical Association is a younger society but fulfills for the northern portion of our state the same function as does the Southern Minnesota Medical Association for the lower tiers of counties. A more accurate definition of their boundaries, according to county and district societies, might be worked out to advantage, and would give them both more official recognition in the field of organized medicine.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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Vol. XV October, 1932 No. 10

CARBOHYDRATES IN DIABETES

The general practitioner who is called upon to treat a diabetic patient is very likely to be confused as to just what actually is the best combination of carbohydrate, protein and fat. Writers on the subject have had most conflicting ideas.

Before the advent of insulin the problem demanded extreme reduction of carbohydrates to render the patient sugar-free, and safe ketogenic to anti-ketogenic ratio was an important consideration.

With the discovery of insulin the problem assumed a different aspect. Starvation was no longer necessary and the extremely low carbohydrate and high fat diets so unpalatable for the patient became no longer necessary. The pendulum swung to the other extreme. Some writers, notably Sansum, advocated a diet containing corbohydrate of 300 to 400 grams a day—what many normal people consume—with the administration of insulin in large amounts.

The pendulum seems to have acquired its middle point at present. It is common sense that a diabetic diet should resemble as nearly as possible that of the normal individual. Sufficient protein to more than spare body protein (60 to 80 grams), sufficient carbohydrate (100 to 140 grams) to make the diet palatable and not too expensive, and fat sufficient to make up the required calories to maintain a proper body weight. Insulin, if required, is taken in sufficient amounts and at the necessary intervals to maintain the patient sugar-free. On such a diet, with or without insulin, the probability of an acidosis need not concern patient or physician, providing no infection occurs and the patient remains sugar-free.

Dieting, then, is still necessary, the patient still has to be instructed how to plan a diet and has to be encouraged to maintain the diet and to check his status from time to time. Individuals will be found who seemingly cannot be kept sugar-free even on greater restriction of diet than that outlined above and intercurrent infections will practically mullify the action of insulin temporarily.

The fundamental consideration in the treatment of diabetes remain unchanged. The patient is probably less likely to develop the late complications of diabetes and his sugar tolerance is better if his blood sugar is kept within the normal range.

THE CANCER PROBLEM

While little is known about the cause of cancer, and its treatment is far from satisfactory, this is no excuse for relaxing in our efforts to combat this destroyer of human happiness.

Cancer is probably on the increase. This is in part due to the fact that more individuals reach the cancer age. Certain it is that cancer is more accurately diagnosed today than a generation ago.

We do know that certain forms of irritation are likely to lead to cancer. We also know that the earlier cancer is detected the better the chance of cure with the means at our disposal. The method of attack is clear—the prevention of tissue irritation and early diagnosis.

Certain forms of cancer appear in the readily accessible parts of the body—the mouth, skin, breast, cervix and rectum. It is here that it can be detected early and in many instances prevented. The public is well informed of the importance of oral hygiene, although too many are unable to obtain proper dental service. The importance of the visual examination and treatment of the post-partum cervix has not been sufficiently appreciated by the profession and as a result by the laity.

When it comes to the detection of early cancer of the breast, education of the public is essential. In a recent circular letter to the state medical journals, Dr. Bloodgood of Baltimore brought out some interesting data about breast cancer. He states that if 1,000 apparently normal women are examined, 1 per cent will be found to have cancer of the breast. This number will have a 70 per cent chance of cure. Three per cent of the 1,000 examined will be found to have lumps in the breast which are not cancer, and as many as 25 per cent will be found to have lumpy conditions of the breast which have nothing to do with cancer. If, on the other hand, 1,000 women who think they can feel a lump in the breast are examined, as many as 10 per cent will be found to have cancer and these women will not have a 70 per cent chance of cure. An additional 15 per cent of these women will be found to have non-malignant lumps in the breast. This is a rather strong argument for Dr. Bloodgood's advocacy of periodic examinations. That some progress has been made through dissemination of information to the laity is shown by the fact that only 10 per cent of the women who come to his clinic now are found to have cancer, whereas, in 1900, Halstead found cancer in 80 per cent of such examinations.

When it comes to hidden cancer the outlook is not so bright. Cancer of the bronchi is on the increase, and why we do not know. Its treatment is most unsatisfactory. Early diagnosis of cancer of the stomach is worth the diagnostic effort because of its occasional operative cure. The operative treatment of cancer of the rectum makes its early recognition worth while.

There is need for intensive research in the cancer field. The New York Laboratory at Buffalo probably ranks first in cancer research. The United States Public Health Service has its research laboratory at Washington and in conjunction with the Harvard Medical School. There is need for the numerous cancer clinics, such as the one at the University of Minnesota medical school. The Veterans Bureau has established a large one at Hines, near Chicago. There is need for the necessary hospital and clinic equipment of radium in sufficient amounts, deep therapy X-ray machines and a competent radiologist. But what is needed most of all is more early diagnosis of cancer which can only result from early consultation when suspicious symptoms arise, and careful examination on the part of the physician.

COMMUNICATION

Duluth, Minnesota
September 8, 1932

Dr. E. A. Meyerding,
11 West Summit Ave.,
St. Paul, Minn.

Dear Doctor Meyerding:

One A. L. (Jerry) Castle, alias Ernest Donald Roberts, pretending to be a physician on vacation from Honolulu, recently victimized a number of Duluthians. His method of approach was through the internes of a local hospital to whom, for a period of some 3½ weeks, he was extremely gracious and whom he entertained generously and at times lavishly. Following his sudden departure, a crop of bad checks has come into bloom.

The man claims to be Welsh and to have had his training in England. He speaks English, French, German and Greek and has a foreign accent. His knowledge of medicine and of outstanding medical men is surprising and convincing even to the medical mind. His manner is extremely gracious and polite. His conversation shows him to be well conversant with music and literature as well as medicine. He entertains well on the piano and with stories. Among other things polo is a favorite game of his and he rides well.

The high lights of his physical appearance are fairly covered by the following: Well dressed; black mustache; dark hair; swarthy complexion; age, about thirty years; height, 5 feet, 8 inches; weight, 150 pounds; eyes, hazel gray; nose, inclined to the Roman; teeth, unusually white and even. All in all, he looks like a German Jew.

As recently as four days ago he was known to be in Minneapolis.

No doubt, other hospitals, medical centers, and physicians will be victimized, wherefore I am writing you this letter.

Yours very truly,
(Signed) M. McC. Fischer,
Director of Public Health.

VITAMIN C—THE ANTISCORBUTIC VITAMIN

Of late, progress toward the isolation and identification of some of the vitamins has been greatly accelerated. According to Rygh and his co-workers, the antiscorbutic vitamin can be produced from the long known alkaloid narcotine and is presumably so derived in nature. Unfortunately, the experimental results and conclusions of these investigators have failed of confirmation by a number of scientific workers both here and abroad. King and his associates venture to identify Vitamin C with the hexuronic acid found by Szent-Györgyi in various plant tissues and in the suprarenal structures. These biochemists have isolated from orange juice a crystalline product that is protective to the conventional laboratory test animal, the guinea pig, in daily doses of 0.5 mg. If the claims are further substantiated, as now seems likely, a great step in advance will have been taken. In any event, further specific knowledge regarding the precise etiology and cure of scurvy cannot fail to result from these trends in research. (Jour. A. M. A., August 20, 1932, p. 658.)

MISCELLANEOUS

SOCIAL INSURANCE IMPOSSIBLE TO ABOLISH WHEN ONCE ESTABLISHED

Edward H. Ochsner, M.D.
Chicago

The worst feature of Social Insurance is the fact that when this parasite once gets its suckers well fastened into the vitals of a nation nothing short of either national bankruptcy, a dictatorship, or a revolution will be able to loosen its hold.

Germany, which has had Social Insurance on its statute books the longest, has for a considerable time been on the verge of bankruptcy. While other facts are operative, we believe that the billion dollars which Social Insurance costs the nation every year is one of the chief reasons why Germany is unable to make a satisfactory "come-back" to normalcy.

England is not much better off. The chief reason for England's present difficulties is the terrific burden of taxation which she has to carry. One writer says: "A complete understanding of the problems confronting England at the present time involves going back to 1909 when we had just adopted old age pensions and destroyed the foundations of thrift." In 1911 England introduced National Insurance when three per cent of its workers were unemployed. After twenty years of operation of the act, seventeen per cent of her workers are out of work. As a partial explanation for this condition let us cite just one example from among scores and hundreds that could be given. A manufacturer found that his orders were only sufficient to give work to all his employees four days a week so he called his workers together and told them the facts. The workers, however, insisted that they would work only three days a week in order that they could draw the dole for the other three days. An English writer commenting on this says: "It is a great mistake to worry about the much discussed abuses of the system. It is the system which is fundamentally wrong and abuse is inseparable from it."

To get an idea of the tax burden which England is carrying, we need but cite facts. In that country all incomes of seven hundred and fifty dollars per annum are taxed twenty-five per cent. Higher incomes carry an additional surtax. Increased taxes have increased the production-cost of practically all articles of manufacture and, as a consequence, have actually increased unemployment because English Industry carrying this extra burden has not been able to compete with other countries in the world markets. In spite of these burdensome taxes and in spite of the fact that living expenses had gone down eleven and one-half per cent, the recent labor government refused to cut the sick benefits ten per cent and put the nation to the expense and turmoil of a national election practically on this issue alone.

The countries just cited are not the only ones encountering similar difficulties. A recent newspaper article contained the statement that there are more than one hundred and fifty federal boards and commissions in Washington each with three or more members drawing salaries and each with a bevy of clerks most of them just drawing salaries. Many of these were created during the World War. When a few farsighted individuals remonstrated against the appointment of so many boards and commissions they were assured that they would all be abolished at the end of hostilities. It is now more than fourteen years since the signing of the Armistice but not one board has as yet been abolished.

Another illustration is the franking privilege to country newspapers. This privilege was extended to them when it was deemed desirable to disseminate news and information to rural inhabitants, particularly to detached settlements. It was a wise and legitimate enactment at the time but now it is just a plain nuisance and yet no congressman would dare to suggest its abolition. It is costing the taxpayer and consumer a great deal of money and serves no useful purpose. A town of ten thousand and even fewer inhabitants usually has two and sometimes three local papers all enjoying this privilege. The local merchants are compelled to advertise in all of them, the expense of which must of necessity be passed on to the consumers. Incidentally this favors the mail order houses to the detriment of the local merchant.

There are many reasons why it is almost impossible to repeal the laws governing such practices. One reason is that executives and legislators do not want them repealed because it reduces the power which they derive through political patronage. The more patronage the individual in office has at his disposal, the more difficult it is to dislodge him. Even today it is very difficult to defeat a public officeholder with large political patronage, no matter how inefficient he may be, except by another who either already has large political patronage or who promises jobs to his supporters irrespective of their qualifications. Thus in many elections the voter is simply left to choose between two undesirable candidates. Already the number of payrollers has become so large and so politically active and influential that they wield great power in both political parties. If we then add compulsory health insurance we will add further thousands to the lists of our civil employees. Those who are not in government employ will be powerless to control government and their only function will be to pay the taxes which others impose upon them. Instead of increasing the number of government officials and employees, the ideal to be constantly kept in mind and striven for in this country is to permit the private citizen to perform all those functions that he can best perform and that make for independence, sef-reliance, and strength of character and to have the government do only those things which the individual cannot do satisfactorily. We maintain that centralization in government and paternalism have already gone much too far and that Social Insurance would simply be another step in the wrong direction.

Another reason why it will be difficult to repeal such laws is the fact that men in the different services of the government do not dare to expose its faults for fear of being accused of disloyalty. Reports must be couched in the most mild and ineffective language possible and then they must not be released to the public but allowed to die as still-births in the departments. We all know what happened to General Mitchell, who dared to disregard these rules. Major-General Robert Alexander also tells in the introduction to his Memoirs of the World War just how this worked in at least one other instance.

In most countries which have Social Insurance such laws were first suggested and urged by welfarers, uplifters, and visionaries who unwittingly played into the hands of practical politicians. Even now few seem to realize that bureaucracy in a republic may become just as unreasonable, oppressive, and ruthless as a despotism.

It will be interesting to see whether we shall be able to profit by the experience of others or whether as a nation we belong to that class of human beings who can learn only by dire personal experience or from national disaster. (The next article will offer a number of counter-suggestions in place of Social Insurance.)

OF GENERAL INTEREST

Dr. Lawrence M. Larson, formerly of the Mayo Clinic, Rochester, Minnesota, is now associated with Dr. Martin Nordland, Minneapolis, in the practice of surgery and surgical diagnosis.

Dr. J. C. Litzenberg, professor and head of the department of obstetrics and gynecology at the University of Minnesota medical school, was elected president of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at the organization's annual meeting at French Lick Springs, Ind.

The Mineral Springs Sanatorium held its annual dinner meeting at the sanatorium at Cannon Falls for physicians of the district, August 25. Speakers were: F. L. Jennings, Glen Lake Sanatorium; L. G. Rigler, University of Minnesota; B. R. Kirklin and W. S. Harrington, Rochester, and J. Morrow, Austin.

Dr. Margaret Warwick, formerly of the Department of Pathology of the University of Minnesota and the Miller Hospital in Saint Paul, now pathologist to the Millard Fillmore Hospital in Buffalo, N. Y., was married on September 19, 1932, to Dr. R. Montfort Schley of Buffalo, N. Y. She will continue her work at the hospital and will live at 610 Potomac Avenue.

An exhibition of a motion picture film entitled "Birth" was recently given before a group of officers and members of the Hennepin County Medical Society. The film was produced in Switzerland, and its purpose is to encourage prospective mothers to consult regular physicians or recognized hospitals. The physicians who viewed the film expressed the opinion that there was nothing in it that would be objectionable for public exhibition, and that it had definite educational value.

EXTENSION COURSE IN TUBERCULOSIS

Dr. J. A. Myers, Professor of Preventive Medicine at the University of Minnesota, and Chief of Medical Staff of the Lymanhurst School for Tuberculous Children, has arranged with the Extension Division of the University of Minnesota to offer a course of seventeen lectures on tuberculosis to graduate physicians this year.

These lectures have been planned in response to requests from a large number of busy practising physicians who wish to inform themselves thoroughly on the rapid modern advances in the management of pulmonary tuberculosis and allied conditions. The lectures will begin Thursday, October 6, 7:30 to 9:30 p. m., in the Eustis Amphitheater at the University and continue at the same hour weekly for the seventeen weeks of the semester.

1. Diseases of the lungs, including diagnosis and treatment of septic conditions such as bronchiectasis and pulmonary abscess.
2. Demonstrations of iodized oil administrations.
3. Treatment of bronchial asthma associated with hay fever, etc.
4. Diagnosis of pneumoconiosis, with particular reference to silicosis as found among stone cutters.
5. Carcinoma of the lung, with special reference to diagnosis.
6. Tuberculosis presented in its various manifestations from the beginning of the first infection type through all stages to termination with reinfection type.

The course will cover all forms of treatment. Considerable illustration by X-ray film, demonstration of modern diagnostic procedures and administration of therapeutic measures is planned. Ample opportunity will be allowed, also, for examination of patients.

Registration should be made as soon as possible with Mr. R. R. Price, Extension Division, University of Minnesota. The registration fee, $10.00, will cover all expenses of the course.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The programs for the month of October will be as follows:

October 5—Coronary Disease.
October 12—Hearing Tests.
October 19—Prevention of Rickets.
October 26—Advances in Plastic Surgery.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

Announcement of Coming Examinations

The next written examination of the American Board of Obstetrics and Gynecology will be held on Saturday, October 22, at 2 p. m., in 19 different cities of the United States and Canada. In order to reduce traveling expenses for candidates special arrangement may be made through the Secretary for taking the written examination at any city other than those regularly specified where there is a Diplomate who can be empowered to conduct the examination. This arrangement does not apply to the general, clinical examination.

The next general, oral and clinical examination, is to be held in conjunction with the meeting of the Pacific Coast Society of Obstetrics and Gynecology at Los Angeles, California, on December 7, provided there are sufficient applicants.

The only reduction in railroad fares that will be available will be possible seasonal or round trip special rates. Information regarding this should be obtained from any railroad agent. The candidates will have the opportunity also of attending the scientific sessions of this society, as the examination is scheduled for the day preceding the opening of the session.

Applications for these examinations should be filed immediately. Lists close for Group B applicants (see booklet) on October 5, and for Group A applicants on November 15.

For application blanks and other information, address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh, Pennsylvania.

AMERICAN COLLEGE OF SURGEONS

The twenty-second annual Clinical Congress of the American College of Surgeons will be held in St. Louis, October 17-21, with headquarters at the Jefferson Hotel. Dr. Franklin H. Martin, Director-General of the College, informs us that an instructive program of operative clinics has been prepared by the local Committee on Arrangements, of which Dr. Evarts A. Graham is Chairman.

Hospital standardization conferences under the direction of Dr. Malcolm T. MacEachern will be held during the first four days. Four special programs have been prepared dealing respectively with fractures, curability of cancer, industrial medicine and traumatic surgery, and the teaching of surgery and the surgical specialties. Medical motion pictures will be on daily exhibition.

On Monday evening the president, Dr. Allen B. Kanavel, will present his retiring address, "Intangibles in Surgery," and turn over the robes of office to the incoming president, Dr. J. Bentley Squier, who will deliver his inaugural address, "Fundamentals of Specialism." The John B. Murphy oration in surgery entitled, "Pillars of Surgery," will be delivered by Sir William I. DeCourcy Wheeler, M.S., F.R.C.S.I., Dublin, Ireland.

On Wednesday evening a Community Health Meeting will be held with brief instructive talks dealing with personal health and hospital matters.

On Friday evening the convocation will be held for the incoming Fellows, and the Fellowship address on "Some New Things in Physics" will be delivered by Robert Andrews Millikan, Ph.D., LL.D., Sc.D., Nobel Laureate. Dr. J. Bentley Squier will deliver the presidental address entitled, "The American College of Surgeons—Twenty Years of Ambitious Effort."

Among the features of the evening meetings will be the oration on fractures by Dr. Philip D. Wilson and the oration on industrial medicine and traumatic surgery by Dr. Frederic A. Besley. A special program on ophthalmology and otorhinolaryngology will be held at the Statler Hotel and there will be clinics on these subjects during the entire week in the St. Louis hospitals.

Among the other foreign visitors will be Sir George Lenthal Cheatle, London, and Dr. José Goyanes, Madrid.

SCOTT-CARVER COUNTY SOCIETY

B. H. Simons, Chaska, was elected president of the Scott-Carver County Medical Society at the recent annual meeting held at the Commercial Hotel, Chaska. Other officers are: F. H. Buck, Shakopee, vice president; C. F. Cervenka, New Prague, secretary-treasurer; W. S. Emmerson, Mayers, and T. P. Martin, Arlington, delegate and alternate, respectively, and F. C. Westerman, Montgomery, H. E. Wunder, Shakopee, and M. B. Hebeisen, Chaska, censors.

Speakers on the scientific program were Robert Rizer, Minneapolis, and Harry Bayard, Minneapolis.

Archa Wilcox, Minneapolis, addressed the August meeting of the society held at Montgomery, August 9.

REDWOOD-BROWN COUNTY SOCIETY

F. C. Gibbons, Comfrey, J. A. Myers, Minneapolis, and Walter H. Ude, Minneapolis, presented the scientific program that marked the annual meeting of the Redwood-Brown County Medical Society. Tuberculosis was the subject of discussion. The following officers were elected: O. J. Seifert, New Ulm, president; Albert Fritsche, vice president, New Ulm; W. A. Meierding, secretary-treasurer; Theodore Hammermeister, New Ulm, and William McLane, Sleepy Eye, delegate and alternate, respectively; A. P. Goblirsch, censor.

SOUTHWESTERN MINNESOTA SOCIETY

The Southwestern Minnesota Medical Society met at the new Indian School Hospital, Pipestone, Minn., Sept. 20, 1932. At 6:30 P. M. a banquet was served, after which a program was given by the Indian children of the school, including two numbers by the Girls' Glee Club, Indian dances by the Indian boys in their native costumes and two solos by Owen Lightfoot, who was also dressed in Indian costume.

The following officers were elected: Dr. J. T. Rose, Lakefield, president; Dr. H. DeBoer, Edgerton, vice president; Dr. E. G. McKeown, Pipestone, secretary-treasurer. Dr. S. A. Slater was elected delegate to the State meeting, and Dr. C. O. Wright alternate.

The following doctors were elected as censors for three years: Dr. C. P. Dolan for Nobles County; Dr. L. A. Williams for Murray County; Dr. Walter Halloran for Jackson County.

The following Sioux Falls doctors gave the program:

Dr. T. J. Billion—"Hypothyroidism with Case Report."
Dr. M. A. Stern—"Appendicitis in Children."
Dr. G. E. VanDemark—"Foot Posture."
Dr. N. J. Nessa—"X-ray Studies in Diseases and Injury of Joints."

STEARNS-BENTON AND UPPER MISSISSIPPI SOCIETIES

The Stearns-Benton and the Upper Mississippi Medical Societies will hold an important joint meeting at Little Falls, Saturday evening, October 22.

The meeting will be preceded by a meeting of the Council of the Minnesota State Medical Association and council members will provide the subsequent program. Speakers are: M. S. Henderson, Rochester; H. Z. Giffen, Rochester; J. M. Hayes, Minneapolis, and W. A. Coventry, Duluth.

MINNESOTA MEDICAL ALUMNI HOMECOMING PROGRAM

Eustis Auditorium, Elliot Hospital
October 28, 1932

9:00 A. M.—Dr. H. P. Ritchie, Speaker.
9:00 A. M.—Non-specific Prostatitis.
Dr. D. Creevy
9:30 A. M.—Mechanics in Genecology or Posture in Relation to Diseases of Women.
Dr. William Rumpf
10:00 A. M.—The Recurrent Goiter.
Dr. Martin Nordland
10:30 A. M.—Painful Feet in Adults.
Mr. M. S. Henderson
11:00 A. M.—Medical Treatment of Acute Sinusitis.
Dr. K. E. Phelps
11:30 A. M.—Manual and Visual Examination of the Rectum.
Dr. H. E. Hullsiek
12:30 P. M.—Lunch—University Hospital
Dean Scammon
Dr. H. Dunn
Business Meeting.
2:00 P. M.—Dr. E. D. Anderson, Speaker.
2:00 P. M.—Skin Clinic.
Dr. C. A. Boreen
2:30 P. M.—Diseases of the Genito-Urinary System in Infants and Children.
Dr. R. E. Nutting
3:00 P. M.—Department of Medicine.
3:30 P. M.—Serial X-ray Plates in Gastro-intestinal Studies.
Dr. R. Morse
4:00 P. M.—Treatment of the Ambulatory Cardiac Patient.
Dr. Moses Barron

All medical men, who are interested, are cordially invited to attend this meeting.

PROCEEDINGS---MINNEAPOLIS SURGICAL SOCIETY

THE PROBLEM OF CANCER TREATMENT*

J. Frank Corbett, M.D.
Minneapolis

As a valedictory it is my purpose to bring before you the problem of cancer treatment. The subject is somewhat chaotic to me and I believe is to some degree to all of you. It is with the hope that this organization may take steps to give a better orientation to its members that I am determined to address you. It is obviously impossible to enter a comprehensive discussion of the literature. The question in the minds of those best informed might be likened to a poorly charted sea. However, there are a few facts that seem to be definitely established. Constructive committee work of this Surgical Society, articulating with similar organizations, could formulate a great deal of importance to all surgeons. The literature is so voluminous and even contradictory that some such means of editing seems imperative.

The purpose of such activity would be to educate all of us in the principles of cancer treatment. The American Society for the Control of Cancer has organized local committees as well as state committees. The function of local committees is given as follows: "They play important and active part in that they give information to the public on cancer and existing facilities for its treatment; coöperate with health officers and chairmen of Cancer Committees of State Medical Societies and in many ways coördinate further various educational activities for more efficient control of malignancy. Additional chairmen will be appointed as local conditions warrant."

This apparently concerns not only the public but also the doctor. Bulletins at a cost of $1.00 per year are issued on purely technical matters that concern both diagnosis and treatment. This material is condensed but is of value so far as it goes. For example, the article, "Newer Development in X-ray Therapy of Cancer[1]," gives a bird's-eye view of X-ray treatment. Many other excellent articles are given for the advancement and diffusion of knowledge among surgeons.

To the real student of cancer, the *American Journal of Cancer,* the official organ of the American Society for the Control of Cancer and the American Association for Cancer Research, offers many original articles and abstracts of a great many more.

It is my desire to bring before the Surgical Society the advisability of organizing a local committee on cancer similar to the fracture committee. To this committee could be added the names of roentgenologists, physicists, gynecologists, and surgeons representing each hospital in Minneapolis.

The importance of early diagnosis has been well broadcast to the public. The laity are doing their part. However, Dean Lewis has stated that only 20 per cent of stomach carcinoma is operable at the time chosen for operation. Many of us see cases of breast cancer with axillary metastasis and occasionally a cancer en cuirasse. Many of these have long histories. Early cases offer a good chance of cure, but intelligent laymen often do not appreciate this.

To the doctors, the organization and supply of an armamentarium is fundamental, as well as knowledge of how to use this. It is my belief that our local equipment is not well organized and to some degrees does not exist. To elaborate this last statement it is only necessary to state what everyone knows, that the treatment of cancer comprises two procedures, *i.e.,* surgery, and the use of X-ray or radium. The surgical rules, one might say, are established. Certain kinds of cancer are primarily operable; certain kinds require adjuvant X-ray or radium treatment; and certain kinds should best be treated by radium alone. For example, Recasens[2] states that cancer limited to the cervix may be treated by surgery or radiation. Radiation is contraindicated only in groups that lack radiosensitivity as can be determined by histological methods. He further states that border-line invasions should first have radium and later surgery, and that in advanced cases radium is the only choice.

The lymphatic supply of the breast has been well studied and is fairly definite, but the direction cancer cells take in these channels is subject to individual variation. It is manifestly impossible to remove all the lymphatics at operation, and the complete dissection of all axillary and cervical glands is a formidable process, removal of all the glands being impossible. Fortunately surgery can be helped by radiation.

In the discussion of the subject at the last meeting of the Western Surgical Society, there seemed a definite tendency to favor supplementary radiation of untouchable regions following operation. By this means the deep lymphatics through which cancer spreads to the bones or the chest can be blocked. This statement is based on the opinion that bone metastases are lymph-borne, as has been promulgated by Carnett.[3] In addition, operations are seldom followed by local recurrences, or immediate metastases, as might be expected if embolic masses were liberated by rough handling. Recurrences from breast cancer are in the spine, the long bones, the pelvis, and the lungs. Garnett and Howell state that of 204 breast cases treated, 49 per cent gave evidence of bone metastasis. Himmelman's figures of 42 per cent of breast cases alive for three years and 36 per cent alive after five years serve as an example.

With the purpose of emphasizing the necessity for organization of a large supply of radium, I will quote Warwick.[4]

Warwick describes a technic for cancer of the breast which combines the advantages of surgical destruction of the local growth with the advantages of radium in attacking the lymphatic spread under supraclavicular triangle, and the anterior extremities of the upper intercostal spaces. A radical breast operation, where this is possible, is followed by the insertion of radium needles as follows:

"A. One 1.5 mg. (2 cm. long) needle above the first rib anterior to and below the axillary vein after clearing out the minute pocket in this situation."

"B. Two 3 mg. (4 cm. long) needles above the clavicle. These inserted through the skin of the supraclavicular triangle with a guiding finger in the axilla protecting the plexus and vessels."

"C. Four or five 2.5 mg. (3 cm. long) needles on each side into the anterior extremity of the upper four or five intercostal spaces. On the side of the operation they are placed between the intercostal muscles, and on the opposite side they are inserted through the skin after closure of the wound."

"D. Ten to twelve 3 mg. (4 or 6 cm. long) needles between the intercostal muscles of the upper spaces, covering the chest wall between the sternal needles and the point of exit of the lateral thoracic nerves."

"E. Four or five 3 mg. (4 or 6 cm. long) needles directed posteriorly between the intercostal muscles in the upper spaces from the points of exit of the lateral cutaneous nerves. In the first space a shorter needle may be used."

"F. Four 3 mg. (4 cm. long) needles in the axilla, two anterior to the plexus, stitched to the posterior surface of the clavicular head of the pectoralis major with fine plain catgut, and two behind the plexus stitched to fascia over subscapularis."

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*President's Address, read before the meeting of the Minneapolis Surgical Society held May 5, 1932.

"G. Two or three 3 mg. (4 cm. long) needles are stitched in the epigastric angle."

With C, D and E the needle point may be seen to be raising the thin intercostal muscle while it is being inserted beneath it. The radium needles are removed a week later under gas and oxygen anesthesia.[5]

A more feasible use of radium is described by Lockwood.[6] The total amount used is 1,200 mg. hours as needles on the outside of the skin.

With this in mind, the control of a large amount of radium and the proper distribution of radium are paramount. When the radium emanations are available, the problem is simplified. I cannot enter into a debate as to the relative merits of actual radium and radium emanation. To surgeons of Minnesota, except the University Hospital and Mayo Clinic, the use of emanation is almost a closed book. Chicago is prevented from furnishing such emanation because of certain districting restrictions. New York is the nearest station. All emanations deteriorate with time and the degree of deterioration has to be established by a physicist. If emanations are desirable, then a central plant for collection is a much needed institution. Here the surgeon and the physicist could coöperate and no valuable time be lost. The physicist can go far but the treatment is dependent to a degree on information that the surgeon alone can supply, for the following reasons: Cancers vary in their physical structure and all kinds do not react the same to radium. The histological structure of the tumor, its vascularity, amount of connective tissue and cellular character are variable. Not only is coöperation necessary but a clearing house of the data is necessary to definite knowledge.

The question of records is important. Simply to state that so many carcinomas of the cervix were cured by operation or by radium is not of much value. For example the histological structure of carcinoma of the cervix seems to determine the fate of the patient. McNamara[7] describes two groups: (1) those of high malignancy, comprising 276 cases all of which were dead within three years; (2) those of low malignancy all living after five years (15 cases). The characteristic picture in low malignancy is epithelial pearls with tendency to keratohyalin formation. Therefore, records must include histological classification as well as clinical or anatomical classification, that is, knowledge of the cell and knowledge of gross structure and distribution.

Deep X-ray Therapy: The use of deep X-ray therapy as a routine post-operative measure has at times been attacked. Himmelman's cases[8] (Groups I, II, III, IV, Jungling system) gave, for surgery alone, 42 per cent alive at the end of three years and 36 per cent alive at the end of five years. The cases treated by operation and postoperative radiation gave 32 per cent alive after three years, and 16 per cent after five. The same conclusion was expressed in an address given in Minneapolis by W. A. Coventry of Duluth. However, I am not satisfied that more recent development of radiation has not rendered these figures obsolete.

The effect of deep X-ray on the patient is marked. It is probable that abuses occur to some extent. Its effect on glands of internal secretion should be kept in mind. The following methods of application have been the subject of much controversy as to which one was best. The best method is far from established.

I. Filtered fractional high voltage rays, repeated often for a considerable time.

II. Massive doses, as employed by Seitz and Wintz in Germany, are in some respects the direct antithesis of I.

III. Kingerey's saturation technic based on the theory of quantitative loss of biological effect with successive rays. Attempt is made to maintain the saturation by successive doses.

IV. The so-called "carcinoma dose," in other words, the dose sufficient to cause an erythema or burn. This apparently is not as popular as it once was, for the reason that cancer seemed to spread in the X-ray scars.

Much valuable information is available. *The American Journal of Roentgenology and Radium Therapy* has devoted a large part of the April, 1932, number to a discussion of therapy for cancer of the breast. At the end of this discussion is a symposium by Ewing, Pancoast, Kaplan, Dorrance, and Neil. In order to bring the question before the Society and that we may judge of the magnitude of the problem of cancer treatment, I have presumed to present a very brief abstract of certain papers. Special consideration should be given to the table giving the number alive with no treatment and various forms of treatment. One feels discouraged, but is goaded to greater effort in attacking the dilemma. The abstracts are as follows:

Results of Radiation Therapy in 1,022 Private Cases of Carcinoma of the Breast from 1902 to 1928: George E. Pfahler[9]: "Radium is in my opinion relatively more powerful for its local effect on cancer than the roentgen ray, but for deep effects and a wide distribution, it is of less value unless used in very large quantities at a distance." "Mr. Sampson Handley believes that breast cancer when it comes to operation is always an intrathoracic condition and rational treatment is to irradiate the chest more thoroughly with attention to lymphatic areas. The time for irradiation is two weeks after operation."

Comparative value of operation and radiation at end of three years:

	Alive (%)
No treatment	24
Incomplete operation	29
Complete operation	51
Complete operation and irradiation	66

Post-operative Roentgen Therapy for Cancer of the Breast. 103 Consecutive Cases. U. V. Portmann[10]: "It is very questionable whether malignant diseases can be completely eliminated where the axilla is involved, even by the most skillfully performed operation."

Forty per cent of those operated remain alive and free from manifestations three years.

Thirty per cent of those operated remain alive and free from manifestations five years.

Fifty per cent of those operated plus radiation free from manifestations three years.

Forty-two per cent of those operated plus radiation free from manifestations five years.

Treatment of Metastases and Inoperable Mammary Cancer. Frank E. Adair.[11] Treatment of metastasis and inoperable primary cancers is discussed. Bloodgood's statistics are quoted as follows:

"Five-year cures, no axillary involvement	70 per cent.
Five-year cures with axillary involvement	20 per cent."

"To my mind the most outstanding problem of breast cancer is the question of how to treat the axilla. It is the only area of metastasis where we may still hope to obtain a cure after metastasis has occurred." Radium seeds are advocated after surgery. For example, S. Z., female, aged 34, on admission to the Breast Clinic, was classified as primary inoperable mammary cancer, on account of its being metastatic to the axilla and the supraclavicular region. The patient was given a high voltage roentgen cycle of four treatments, two of which were directed into the axilla, the last being on January 7, 1929. Following this treatment (January 27, 1929) the patient was given 14,000 mc.-hr. by radium element pack over the axilla. One month later the supraclavicular nodes and the breast disease had disappeared. The axillary disease was slightly diminished in size but still persisted. On August 15, 1929, 21 mc. of radon were placed in the axilla in gold seeds. Two months later there was complete disappearance of the axillary mass, and to date, January 1, 1931, 22.5 months afterward, there has never been any recurrence of a previously bulky axillary mass. The pathological report was "cellular adenocarcinoma." This case report is given in that it emphasizes necessity of equipment.

Interstitial Use of Gold Filtered Radon Transfixation Tubes. George Pack.[12]

Pack urges his method as a substitute for surgery and not as an adjunct. Primary inoperable cases just beyond the borderline of operating are suitable for this method.

The surgeon is concerned with these treatment problems and should have some intelligent idea of the methods proposed. The effect of X-rays on the patient must be considered, such as pain, digestive disturbances, weakness, and even the necrosis that sometimes causes the death of the patient if used with no other idea than annihilation of cancer cells. It is only possible for the physician to meet the problems involved by correlation of efforts on the part of the entire profession. Such an effort can come only through widespread coöperation, in which local societies and groups should take part. The American College of Surgeons is probably the proper organization to carry out in general fields what it has accomplished in bone tumors. No method has escaped criticism. It is apparent that much would be gained by the including of roentgen specialists in our local committee. Cancer of the breast has received much attention in the preliminary sketch. My reason for this has been the discouraging results most of us have had with recurrence from six months to as late as fifteen years, following operation. The end-results as indicated by Dean Lewis are not over 10 per cent cure. After reading Pack's article and that of Burton J. Lee,[13] I still believe that surgery should not be entirely eliminated.

The precancerous lesions probably offer a more attractive field. In brief, they are:

I. Stomach: (1) atrophic gastritis (Billroth and Rehfuss); (2) ulcer (Wilson); (3) polyps.

II. Breast: All tumors (immediate biopsy).

III. Skin: Eller and Anderson[14] attempt to show that there are at least twenty skin conditions which may be forerunners of cancer, the recognition and judicious treatment of which might aid in lowering the mortality rate from the later disease: (1) syphilis, especially of the mucosa of the mouth and tongue; (2) leukoplakia of the tongue, lips, and buccal muscoa; (3) roentgen and radium sequelæ, especially keratoses; (4) moles, especially the bluish-black or slate-black variety; (5) senile keratoses (keratoderma); (6) kraurosis vulvæ; (7) occupational keratodermas, as those occurring in workers exposed to coal tar, arsenic dust, heavy grade mineral oils, shale oil, roentgen-rays, and radium; (8) lupus vulgaris; (9) keratoses resulting from the external use of arsenic; (10) sebaceous cysts, chiefly on the face and scalp; (11) lupus erythematosus, usually of long standing; (12) varicose ulcers (in which, however, the incidence of cancer is surprisingly low, and fistulæ, chiefly about the ankles and calves; (13) Paget's disease of the nipple, considered by many authorities as a true cancer rather than a merely precancerous condition; (14) cicatrices, especially from third-degree burns; (15) cutaneous horns most frequently found on scalp and face, less often on buttocks, penis, scrotum, and nails; (16) Bowen's disease, an extra-mammary Paget's disease; (17) papilloma of the tongue; (18) xeroderma pigmentosum; (19) rarely, inflammatory dermatoses, as eczema, lichen planus, and psoriasis.

IV. Cervix: leukoplakia (Hinselmann).

V. Mouth and Tongue: leukoplakia.

VI. Bladder: papilloma.

I have tried to demonstrate to the Surgical Society that the treatment of cancer, particularly of the breast, is not in a satisfactory state. It is for the purpose of collecting knowledge and later distributing it that the demand is made for a Local Cancer Committee. The members of this committee, each in his own chosen field, can make a complete study of the literature and determine what should be done. With this information it is probable that a suitable armamentarium can be assembled to render the treatment of cancer more certain and satisfactory.

In Minneapolis we have a supply of radium. The largest amount is about one-third of a gram. No survey of radium has been made but this could easily be done by the local committee. In Minneapolis two plants for deep therapy exist. More definite knowledge of these could be ascertained. The details of measuring X-ray radiation have been established by the Bureau of Standards at Washington. This is for the physicist.

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12. Pack, George: Interstitial use of gold filtered radon transfixation tubes in the treatment of mammary cancer. Am. Jour. of Roentg. and Rad. Therapy, 27:532, 1932.
13. Lee, Burton J.: Interstitial irradiation of mammary cancer with special reference to measured tissue dosage. Am. Jour. of Roentg. and Rad. Therapy, 27:547, 1932.
14. Cancer supervention in skin diseases; clinical, microscopic, and therapeutic considerations. Brit. Jour. Derm. and Syph., 42:263, 1930.

SCOT TISSUE

The urge to overdo in advertising is not better exemplified than in the recent exploitation of Scot Tissue toilet paper. Scot Tissue has recently been advertised as being "chemically pure"—though for what reason it should be so pure is not obvious. It is defined as being "The absorbent soft white toilet tissue . . . medically safe . . . approved by doctors, hospitals and health authorities." In recent months the firm has reverted to "Science"—with a capital S—to aid it in its efforts to inform the public of the absolute safety of these absorbent rectal-health tissues. The advertising agency of the Scott Paper Company, evidently realizing the possibilities of chemical examination, set forth to have "research" done in a "nationally-known laboratory." In advertisements giving the results of this "investigation" is the warning: "Science finds Harmful Acids . . . Mercury . . . Arsenic in many brands of Toilet Tissue." "660 Brands Tested . . . 2 out of 3 found 'Unsafe . . unfit to use.'" "Use only tissues you know meet the standards which physicians approve." The Scott concern has dragged in the good name of medicine in an attempt to make the public believe that "medical science" had investigated the toilet paper problem and had found certain samples to contain arsenic, mercury and other substances "in sufficient quantities to cause rectal illness." Neither independent research nor the Scott concern's own investigation have proved any such thing. (Jour. A. M. A., July 16, 1932, p. 241.)

ESTIVIN

The producer's statement as to the composition of "Estivin" that it is an "extract of rosa gallica (red rose)" is indefinite and meaningless; the product has not been accepted by the Council on Pharmacy and Chemistry. The evidence regarding the efficacy of the product is conflicting. It is probably of little actual value, as patients, generally, are not enthusiastic about continuing its use. (Jour. A. M. A., January 23, 1932, p. 341.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

The Failing Heart of Middle Life. Albert S. Hyman, A.B., M.D., F.A.C.P. Cardiologist, Beth David and Manhattan General Hospitals, etc. 538 pages. Illus. Price, $5.00, cloth. Philadelphia: F. A. Davis Company, 1932.

The Curative Value of Light. Edgar Mayer, M.D. Consultant in Light Radiation to the American Medical Association, etc. 175 pages. Illus. Price, $1.50, cloth. New York: D. Appleton & Company, 1932.

The Sputum. Its Examination and Clinical Significance. Randall Clifford, M.D., Associate in Medicine, Peter Bent Brigham Hospital, Assistant in Medicine, Harvard Medical School. 167 pages. Illus. Price, cloth, $4.00. New York: The MacMillan Co., 1932.

Functional Disorders of the Large Intestine and Their Treatment. Jacob Buckstein, M.D. Instructor in Gastrointestinal Roentgenology, Cornell University Medical College, etc. 265 pages. Illus. Price, $3.00, cloth. New York: Harper & Brothers, 1932.

Mental Deficiency Due to Birth Injuries. Edgar A. Doll, Ph.D., Director of Research, Training School at Vineland, Winthrop M. Phelps, M.D., Professor of Orthopedic Surgery, Yale University School of Medicine, Consultant on Birth Injuries, Training School at Vineland, and Ruth Taylor Melcher, M.A., Research Assistant, Training School at Vineland. 289 pages. Illus. Price, cloth, $4.50. New York: The MacMillan Co., 1932.

PRACTICAL TREATMENT OF SKIN DISEASES.

Eduard Ahlswede. 770 pages. Price $12.00. New York: Paul B. Hoeber, Inc., 1932.

The average physician needs a volume on practical skin therapy and may rightfully complain that the size, detail and cost of this effort tend to eliminate it from the "practical" class. The preparation of this volume was a most ambitious undertaking. Arranged logically and systematically, it contains much valuable information and many prescriptions which have been handed down by famous dermatologists. With Teutonic thoroughness, the author lists all of the remedies and procedures which have been suggested for each condition, so that the multiplicity of suggestions is sometimes bewildering. The volume is a veritable encyclopedia for the dermatologist.

Thomas Myers, M.D.

CLASSIFIED ADVERTISEMENTS

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MINNESOTA STATE MEDICAL ASSOCIATION

Seventy-ninth Annual Session

Saint Paul, Minnesota

SECOND MEETING OF THE HOUSE OF DELEGATES*

Tuesday Luncheon, May 24, 1932

The meeting convened at twelve-fifty o'clock, President Henderson presiding.

President Henderson: Please come to order.

The first matter of business is a summary of the minutes of the previous meeting.

Secretary Meyerding read the minutes of the previous meeting.

President Henderson: You have all heard the minutes, gentlemen. Are there any alterations or corrections?

Dr. F. J. Savage (St. Paul): The report of the Committee on Schools for Laboratory Technicians was referred by action to the Council. It wasn't acted on by the House.

President Henderson: Are there any further corrections? If not, may we have a motion?

Dr. Hagen: I move that the report be accepted.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: We will have a roll call.

Secretary Meyerding called the roll, and the following delegates and alternates responded:

SOCIETY	DELEGATE	ALTERNATE
Blue Earth Valley	A. J. Henderson, Kiester	
Clay-Becker		O. O. Larsen, Detroit Lakes
Goodhue County	M. W. Smith, Red Wing	
Hennepin County (Minneapolis)	A. S. Hamilton E. A. Loomis J. M. Hayes Ivar Sivertsen Chas. R. Drake W. A. Fansler Julius Johnson	
Houston-Fillmore		C. B. Eby, Spring Valley
Lyon-Lincoln	E. T. Sanderson, Minneota	
Mower County	P. A. Lommen, Austin	
Olmsted County (Rochester)	F. A. Willius A. W. Adson W. I. Lillie W. F. Braasch L. W. Pollock R. D. Mussey	
Park Region	A. J. Lewis, Henning	
Ramsey County (St. Paul)	E. M. Hammes W. C. Carroll Joel C. Hultkrans Wallace H. Cole	K. Dedolph A. G. Schulze
Red River Valley		J. F. Norman, Crookston
Redwood-Brown	Geo. B. Weiser, New Ulm	
Rice County		F. J. Lexa, Lonsdale
St. Louis County	B. S. Adams, Hibbing J. R. Manley, Duluth F. H. Magney, Duluth C. L. Haney, Duluth	
Scott-Carver	H. A. Schneider, Jordan	
Minnesota Southwestern	S. A. Slater, Worthington	
Steele County	A. B. Stewart, Owatonna	
Upper Mississippi	J. A. Thabes, Brainerd	
Washington County	E. S. Boleyn, Stillwater	
Winona County	C. P. Robbins, Winona	
Wright County		E. Klaveness, St. Paul

President Henderson: Report of the Credentials Committee.

Dr. Stewart: Forty-five were handed in yesterday, and three today, which makes forty-eight, all told.

President Henderson: There were forty-eight credentials handed in, and thirty-eight are present. Is that it?

Now, we will have the report of the Council meeting.

Dr. H. M. Workman read the report of the Council.

SECOND MEETING OF THE COUNCIL

The second meeting of the Council of the Minnesota State Medical Association was held at noon, Monday, May 23, at the Minnesota Club.

The chairman called the meeting to order.

The following were present: Dr. M. S. Henderson, Dr. H. M. Workman, Dr. W. A. Coventry, Dr. F. J. Savage, Dr. W. H. Condit, Dr. L. Sogge, Dr. H. Z. Giffin, Dr. W. W. Will, Dr. O. J. Hagen, Dr. J. S. Holbrook, Dr. W. A. Piper, Dr. E. A. Meyerding.

The Secretary read a resolution from the Committee on Schools for Laboratory Technicians. A discussion followed.

The Secretary also read the second, third and fourth resolutions. A Committee consisting of Dr. Condit and Dr. Savage was appointed to investigate and report at the next meeting of the Council.

The Secretary read a letter from Dr. A. J. Chesley, regarding the White House-Minnesota Conference on Child Health and Protection. A motion was made and carried that the Committee on Public Health Education be designated to work in conjunction with the State Planning Committee of the State Department of Health, and report to the Council in the fall.

The report of the Radio Committee was considered. The matter was referred to Mr. Price of the Extension Division, University of Minnesota, and upon his request the following telegram was sent to the Federal Radio Commission at Washington, D. C.

"Minnesota State Medical Association has taken position endorsing application of three educational institutions for additional time in their controversy over station WRHM of Minneapolis."

The Chairman reported on the care of the indigent in his county.

A motion was made and carried that the Committee on State Health Relations be requested to institute a question and answer column or correspondence on laws concerning the care of the indigent.

The meeting adjourned.

Dr. W. H. Condit (Minneapolis): I would like to make one correction there. The Y. W. C. A. of Minneapolis was enjoined legally against giving adverse information to prospective students to the Northwestern Institute. That has nothing to do with these resolutions, but that is pending now.

President Henderson: Any furher corrections or comments?

Dr. Charles R. Drake: I think I can give you a little more information in regard to that injunction proceeding against the Y. W. C. A. The Vocational Department of the public schools of Minneapolis and the Y. W. C. A. have been asked at various times for information about these commercial courses for laboratory technicians. On the advice of a committee on medical technicians they have come to us for advice, and have asked what we thought of it. Of course, our opinion wasn't very favorable, and they have passed this information on to a large number of students who have asked them for this information. This one school particularly didn't like it.

I feel it is perfectly right for anybody to pass on and give judgment upon any school of any kind or description in the United States, or the state of Minnesota, or anywhere as to what you think about it without infringing upon your rights as a citizen of the United States. Therefore, they have been passing this information on to these people.

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*Minutes of the first meeting were published in the September number of Minnesota Medicine, pp. 615-646.

Then an injunction proceeding was instituted against the Y. W. C. A., against the Travelers Aid, and a few others for the purpose of getting them to keep their mouths shut. I happen to be quite intimately connected with that thing, and although they brought the injunction against those people they didn't bring it against me. They are not willing, nor do they care. They are afraid to monkey with the medical association. Answers are being brought in. The thing is being delayed. I think the Y. W. C. A. and its attorney will beat this case. Through education, these schools will fall by the wayside gradually, but our committee wanted not a condemnation of those commercial schools—no. We merely want adoption of the principles as laid down by the American Society of Clinical Pathologists. The American Society of Clinical Pathologists has an approved list of schools. They also have a registry for technicians. There are certain standards they have to meet in order to get into either one, and it is with the hope of the endorsement of this program by the American Society of Clinical Pathologists that these resolutions were put forth. It was not desired to make any statement to condemn any commercial school, but by reason of the approval of the opposite the commercial schools will fall by the wayside.

I hoped that some such action could be taken at this session so that we would have some strength in order to carry on this fight against the injunction. I don't believe the injunction will carry through. If it does, it won't make any difference. It merely takes the Y. W. C. A. and says they can't tell anybody about any school in Minneapolis, or any other place. I don't think it is within the rights of citizenship to compel you to keep your mouth shut as to whether Hammond University, or any other university, is good, bad, or indifferent.

I make these few remarks because I happen to be intimately connected with the Y. W. C. A. proposition and know the inside procedures. They have referred student after student to me, to Dr. O'Brien, to Dr. Rigler, Dr. Schulze, and to others for information along this line, and we have given our information not condemning them openly in any way but simply not giving them our approval, and in that way we claim we have not slandered them. Furthermore, these schools do not have men who are members of the State Medical Association or the County Medical Association. None of them are especially in good standing and those things can be cited.

In a roundabout way they have even threatened me, but I am not afraid of their threats. You have to take this thing in hand. The medical profession should control the education of these medical technicians, and it should also discourage the indiscriminate handing out of diplomas through these diploma mills.

We have grass widows, sod widows, old worn out nurses and people fifty and sixty years of age applying for this particular work. They say it is an easy, soft-snap job, and big pay. I won't go any further.

All I wish is that we did have some sort of approval of the State Association of the stand of the American Society of Clinical Pathologists, not necessarily the approval of all those resolutions that were offered, but the standard of the American Society of Clinical Pathologists which has also been approved, I am quite certain, by the American Medical Association. We do not mention and have never mentioned, and do not propose to mention any of the schools excepting in the general terminology as a commercial school.

Dr. C. B. Wright: Has this matter been brought up and acted on in any way by the Hennepin County Society?

Dr. C. R. Drake: I rendered one report to them, and brought up that mandamus or injunction proceeding and showed it as being a good thing for the archives of the society. My report was accepted by the Hennepin Society. The Public Welfare Committee of the Hennepin County Medical Society has also endorsed our work and our stand on the proposition. The Ramsey County Medical Society have informed certain members of their organization that if they had anything to do with any of these schools they would lose their membership in the county society. That is the stand of those two societies.

President Henderson: Dr. Workman. have you anything to say?

Dr. Workman: Nothing further. I knew nothing about it except what came before the Council.

President Henderson: As it came before the Council, I think the consensus of opinion was that there was some possibility of a medico-legal aspect to this thing, and that we had to go slow. This is the kind of information we want, and I am sure the Council would be glad to hear from Dr. Drake about it.

Is there anything further?

Dr. A. G. Schulze (St. Paul): In the past while I was chairman of this committee, and looking back now, I am surprised I haven't been under arrest for all the answers I have given to prospective students. In the past I have been telling prospective students the reason we don't endorse those schools is because they are not endorsed by the organized medical profession of the state. Is there a better answer than that that can be given?

Dr. C. R. Drake: That is the best answer.

Dr. Schulze: There is no argument.

President Henderson: You have heard the report of the Council.

Dr. Workman: I move it be adopted.

Dr. Adams: I second the motion.

The motion was put to a vote and carried.

President Henderson: The next matter of business is an important one, the election of officers. I will call for nominations for the office of President.

Dr. J. M. Hayes (Minneapolis): I would like to place in nomination the name of Dr. Pearce of Minneapolis. He is a man who has done a great deal of work for the state association and the public health association, and I know of no better man for this position.

President Henderson: You have heard the nomination of Dr. Pearce of Minneapolis.

Dr. E. S. Boleyn (Stillwater): I wish to second that nomination.

President Henderson: Are there any further nominations, gentlemen?

Dr. Adams: I move that nominations be closed.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: Dr. Pearce is elected. I will appoint a committee of three to escort Dr. Pearce in: Dr. Hayes, Dr. Carroll and Dr. Boleyn to inform Dr. Pearce that he has been elected to the office of President.

Dr. C. B. Wright: May I suggest that I don't think this thing is legal until someone moves that the Secretary cast the ballot for Dr. Pearce.

President Henderson: Will somebody kindly make a motion?

Dr. Hagen: I move that the Secretary be instructed to cast the ballot for Dr. Pearce.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary hereby casts the unanimous ballot of the Association for Dr. N. O.

Pearce of Minneapolis as President of the State Society for the next year. (Applause.)

While we are waiting, the President asked me to read a telegram from the Iowa State Medical Society:

> Greetings from the Iowa State Medical Society and best wishes for a successful, worthwhile meeting.
>
> R. L. Parker, Secretary,
> Iowa State Medical Society.

The audience arose and applauded as President-Elect Pearce was escorted into the room.

President Henderson: I want officially to congratulate Dr. Pearce. I think the Association is very fortunate in having Dr. Pearce as President. He has shown a great deal of interest in the State Association for many years. He is a man of executive ability, and I know he is untiring in his efforts for the furtherance of the interests of the society. Dr. Pearce, we should like to hear a few words.

President-Elect Pearce: It is needless to say I feel very greatly honored, and I certainly feel very grateful to you all for conferring that honor on me. As I look around this room, I know there are any number of men who are more deserving probably of this honor than I am, or ever will be, and I don't know how I can qualify for this office any better nor as well as a great many of you.

If a very sincere interest and endeavor to advance the welfare of the medical profession and the University Medical School and the other medical institutions of the state will act as a qualification, I believe I have that very much at heart.

Thank you.

President Henderson: Next is the office of First Vice President.

Dr. W. W. Will (Bertha): I would like to place in nomination a man who has ever shown an interest in the Association, and of late years has been a very worthy Councilor, W. A. Piper of Mountain Lake.

The motion was seconded.

Dr. Hagen: I move that nominations be closed and the Secretary instructed to cast the unanimous vote of the Association for Dr. Piper.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary casts the unanimous vote of the Association for Dr. Piper of Mountain Lake as First Vice President.

President Henderson: Nominations are in order for the Second Vice President.

Dr. F. J. Lexa (Lonsdale): He has been past president of the Southern Minnesota Association and Vice President of the Rice County Medical Society. He has always been very active in all the work, and is very well known to you, and that is Dr. Fred Huxley of Faribault, Minnesota.

The nomination was seconded .

Dr. H. M. Workman (Tracy): I move that the Secretary be instructed to cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary hereby casts the ballot for Dr. Huxley of Faribault as Second Vice President.

President Henderson: Office of Secretary.

Dr. E. M. Hammes (St. Paul): I move that the present incumbent be continued.

The nomination was seconded.

Dr. W. W. Will: I move that nominations be closed and that the President be instructed to cast the unanimous ballot for E. A. Meyerding.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: The President hereby casts the unanimous vote of the Association for Dr. Meyerdoing as Secretary. You are elected.

Nominations for office of Treasurer.

Dr. W. A. Fansler (Minneapolis): I place in nomination Dr. Bill Condit.

The nomination was seconded.

Dr. Fansler: I move that nominations be closed and the Secretary cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary hereby casts the unanimous ballot of the Association for Dr. Condit as Treasurer.

President Henderson: There are three Councilors to be elected. The First District.

Dr. A. W. Adson (Rochester): I hereby nominate Dr. Griffin.

The nomination was seconded.

Dr. C. P. Robbin: (Winona): I move that nominations be closed and the Secretary cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary casts the ballot for Dr. Griffin as Councillor for the First District.

President Henderson: Councilor for the Second District. W. A. Piper is the incumbent.

Dr. E. S. Boleyn (Stillwater): I nominate Dr. Sogge.

The nomination was seconded.

Dr. H. M. Workman (Tracy): I move that nominations be closed, and the Secretary instructed to cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary casts the ballot for Dr. Sogge as Councilor for the Second District.

President Henderson: Councilor for the Ninth District. Dr. Coventry is the present incumbent.

Dr. C. L. Haney (Duluth): I nominate Dr. Coventry to succeed himself.

The nomination was seconded.

Dr. Magney: I move that nominations be closed and the Secretary be instructed to cast the unanimous ballot for Dr. Coventry.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary hereby casts the unanimous ballot for Dr. Coventry as Councilor for the Ninth District.

Dr. E. Klaveness (St. Paul): Dr. Pearce was Councilor for Hennepin County of the Sixth District. Consequently, it would be necessary to elect a man in his place. I nominate Dr. J. M. Hayes of Minneapolis.

Dr. H. M. Workman: I move that nominations be closed and the Secretary instructed to cast the ballot.

Dr. W. A. Coventry: To fill out the unexpired term.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: I hereby cast the unanimous ballot of the Association for Dr. Hayes as Councilor for the Sixth District.

President Henderson: We have to take up the election of delegates to the American Medical Association, two of whose terms have expired. The Council has nominated H. M. Johnson of Dawson, with Dr. E. A. Meyerding as alternate, and with W. F. Braasch as delegate, and W. L. Burnap as alternate.

Are there any other nominations? Would anybody like to nominate any other men from the floor? These are the only two vacancies there are. These men are elected for a term of two years.

Dr. Boleyn: I move the nominations be closed.

The motion was regularly seconded, was put to a vote and carried.

Dr. C. R. Robbins: I move that the President cast the unanimous ballot for the election of these four men: Dr. Johnson, with an alternate of Dr. Meyerding; Dr. Braasch, with an alternate of Dr. Burnap.

The motion was regularly seconded, was put to a vote and carried.

President Henderson: The President casts the ballot for the gentlemen named.

The next order of business is the time and place of the next meeting, and I think I should say a few words about this meeting because I have been pretty much in touch with what has gone on. I just want to say that I think this is the finest state meeting of any kind at any place that I ever attended. Our exhibits, I think, are remarkable. The arrangement is convenient, and we are having a fine attendance.

Those things don't happen out of the thin air. Somebody has to do some work, and I know very well how hard Dr. Meyerding has worked at this sort of thing. It is all well enough to say, "That is Dr. Meyerding's job." That is his job, but there are certain things beyond that he has to do to put a thing over with a zip and a bang.

Dr. Meyerding has been at the beck and call of everybody about this thing for months, and I think we can't be too unanimous in our appreciation of what he has done, and his staff, one and all.

I also want to take this occasion to thank the Committee on Scientific Assembly for the work they have done. We started out with the idea of making this a real fine scientific meeting, so that the men who came would feel they at least got their money's worth. As I say, it is unique in our own history.

So we have to be exceedingly careful in selecting a meeting place. If this is the type of meeting we want it has to be held in such a place as these accommodations can be secured. We want to keep that very clearly in mind if we want this kind of meeting. It is hard to get a place to accommodate such a large meeting. We had 678 doctors registered at noon today, with a total registration of 1,048, which shows that it promises to be the largest meeting we have had. As I wandered around those booths this morning and saw all those fine things on display, I wanted to run here and there and see all the things, but I couldn't get to half the places there is so much going on.

Yesterday I had a very fine looking young man from Minneapolis come along and present me with this. I must read it.

President Henderson read the letter, which was a letter from the business interests of Minneapolis inviting the Minnesota State Medical Association to meet there in 1933.

Dr. W. F. Braasch (Rochester): Representatives of the county came prepared to invite the Association to hold its next meeting in Rochester if the House of Delegates would care to come. However, since we have come here we have learned from our worthy Secretary, Dr. Meyerding, that if the meeting were held outside of the Twin Cities the system of both the commercial and scientific exhibits might be inhibited, and the success of the meeting in the future along the line he has planned and carefully developed with such signal success might be impaired in the future.

We have referred to his wishes in the matter, and in view of this I offer a motion that the matter be referred to the Council and that they appoint a committee to investigate as to the resources of various other cities outside of the Twin Cities where a meeting might be held in the future, and we will abide by their decision in the matter.

The motion was regularly seconded.

Dr. L. Sogge (Windom): May I just have a word on that motion? During my term as President, and before that in the Council, I know there has been considerable talk about making the arrangements that we have at the present time. Dr. Meyerding worked tirelessly for such an arrangement, and I think he has proven, after we finally granted that he was able together with his committee to make a grand success of this arrangement.

I have made it sort of my duty to go around and see some of those fellows who are having their commercial exhibits here, and most of them have said they have never been to a national meeting or a state meeting anywhere where they had better arrangements than they have over here, and they are very highly pleased with it.

As you know, the state meeting has at different times been some expense for the State Association. If you can go on at this rate, soon the commercial exhibits will take care of the state meeting and probably bring us something into the treasury.

I feel we should give Dr. Meyerding, together with the Council, the right to carry this idea further, so I am glad to second the motion of Dr. Braasch.

President Henderson: Dr. Meyerding, would you like to say something?

Secretary Meyerding: This question of an annual meeting, if you have to do the work, is a sort of mixed up affair; you get so many different angles working.

I was very heartily in favor of Rochester two weeks ago before I went to the A. M. A. because I knew we would have the greatest scientific meeting in our history.

We have been approached from time to time and told what a wonderful meeting the Minnesota Dental Association puts on. They have put on a meeting for several years in which their gross income was somewhere between $10,000 and $14,000 from exhibits, and I understand they run practically their whole state society on that money, that is, it goes a long way toward paying their expenses.

I thought it might be the wish (at least that is the way I interpreted it) of the organization that we make some money out of these meeting. How we are going to come out this year, I can't tell. Our preliminary estimate was that our meeting this year will cost our treasury about $500 less than the previous meeting, and you had a greater meeting.

I think the motion to leave it to the Council is a fit one for several reasons. I have watched the A. M. A. in their meetings, and they leave it to, I don't know who, the trustees or the secretary, Dr. West, or somebody who makes all decisions on all meetings. They investigate the places, the opportunities and the privileges extended to them.

This is, of course, an experiment. We are developing this thing, and I think the motion is proper. I am sure you can rest assured the Council will take the proper action. I think it is a very fit motion and will lend itself to the plans as have been discussed in the past, and I hope the motion goes through.

President Henderson: Is there any further discussion?

The question was called for, was put to a vote and carried.

President Henderson: Tomorrow at eleven o'clock at the General Assembly we had planned to present our President-Elect, and I would ask the same committee who escorted him into the room to present him there. All the officers should be there at the time of presentation. All the present incumbents and new officers should be there at that time.

The next order will be any new business.

Dr. Collins: As Chairman of the Reference Committee, I believe we have one report which is being considered by the Council. The Committee on Public Health Nursing I believe had their meeting yesterday and were to report to the Council meeting today, and there has been no mention of it.

President Henderson: That will be presented to the Council today. Is there any other business?

Dr. Harry Oerting: The Committee on Public

Health Nursing held a meeting last evening in my office. The committee is rather new, as you probably know, and there is a great deal of work that needs to be done before we can give any information that will be of much value.

It seems that the Association of Public Health Nurses had passed a bill through the legislature some years ago which they now wish to amend. I have seen a copy of their amended bill and there are a great many things in it that we as an Association couldn't agree to. The matter will have to be taken up with them and ironed out.

Then the law as it now stands, as I understand it, provides that all public health nurses are elected by county boards, and the law provides that there must be on that board either the county health officer or some registered physician. We don't know whether these county boards are complying with the law. One of the functions the committee hopes to accomplish this year is to make a contact with every county society and see that they appoint a committee on public health nursing, and appoint someone who will be active and get in touch with these commissioners and see that one of their members is appointed on that committee. In that way, we can more or less control the appointment of these public health nurses. That matter will be taken up by the committee immediately and by your next session we expect to have some valuable information along that line.

There are approximately 400 nurses doing public health nursing in the state today. I am told by Dr. Locken, who is on the certification board of public health nurses that ten per cent of this number are uncertified for various reasons. We will get in touch with the public health nursing association and have them send us a list of these some forty nurses who are not certified, investigate why they are not certified, and take up with the local community where they are being employed and see what we can find out as to how they happen to be working without certification.

As the law now stands, the law says that the public health nurses must be certified, but the law doesn't say that you have to hire a certified nurse if you don't want to. There are numerous instances through the state where all sorts of politics are taken advantage of. Out on the Range, for instance, I am told that in one of the cities up there every time a new mayor goes in all the public health nurses lose their jobs and others get them. In one town on the range today where a new mayor was elected some time ago, I am told they discharged the public health nurse who had been working there for three years, and hired three practical nurses each of them to work ten days a month, which of course isn't conducive to good work. So we hope at your next meeting to be able to give you a report which will have some value.

President Henderson: Is there any further discussion? You have all heard the report.

Dr. Hammes: I move it be accepted.

The motion was regularly seconded, was put to a vote and carried.

Dr. Hagen: I hereby make this resolution, that a vote of thanks be extended to the Ramsey County Medical Society, the Lowry Hotel, the St. Paul Auditorium, the St. Paul associations, the Daily News and the Daily Dispatch, and the Pioneer Press Dispatch.

President Henderson: We have had a very pleasant time here. I am sure we all want such a resolution.

The motion was severally seconded, was put to a vote and carried.

Secretary Meyerding: Did you want to include the exhibitors?

Dr. Hagen: Yes.

Dr. F. J. Savage (St. Paul): It seems to me a very fitting thing at this time to pass a vote of appreciation to the organizations which have provided the scientific exhibits at our meeting this year.

President Henderson: The motion was just amended to include the exhibitors.

Just to be sure, is there any further business anybody would like to bring up, or anything anybody would like to discuss? In my hurry to get through, I don't want to give the impression that I want to choke off discussion.

If there is nothing further, I will entertain a motion to adjourn.

Dr. Hagen: I so move.

The motion was regularly seconded, was put to a vote and carried, and the meeting adjourned at one-forty o'clock.

SCIENTIFIC PROGRAM

The scientific program of the annual meeting was carried out as published in the May number of Minnesota Medicine with the following exceptions:

In the absence of Dr. Olin West, the Medical Economics meeting, Monday evening, was addressed by Dr. Morris Fishbein, editor of the A. M. A. Journal.

In the absence of Dr. L. G. Rowntree, Dr. Russell Wilder, Rochester, presented a paper entitled "A New Endocrine Disease—Hyperparathyroidism" before the Section on Medicine, Wednesday morning.

In the discussion of the paper entitled "Observations on Arterial Hypertension" presented by Dr. Ralph Major on Wednesday afternoon, Dr. E. T. Bell was replaced by Dr. S. Marx White, Minneapolis.

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HYPERPARATHYROIDISM*

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IF THE age of a clinical entity be judged by the date of its recognition, then hyperparathyroidism may be termed a new disease. Yet, in spite of its belated recognition, there are today but few maladies, old or new, of which the mysteries have been so speedily and completely solved as those of the disease under consideration. When it is recalled that less than a decade ago there was little or no exact information concerning the relationship of the parathyroid glands to certain types of osseous dystrophy, it is readily appreciated that the recently acquired knowledge of this disease represents one of the most brilliant achievements in the history of medicine. For, within a remarkably short period, this clinical entity has been definitely recognized, its pathogenesis fully established, the condition experimentally produced in animals, and arrest of its progress or cure of the disease effected.

Knowledge of this disease has been revealed gradually, through a series of observations and researches, each in itself an important and interesting event, and together they constitute a fine and deserved tribute to modern collaboration between clinical and experimental researches. In 1891 von Recklinghausen described certain skeletal changes which he termed "osteitis fibrosa" characterized by generalized softening and deformity of the bones, with the presence of reddish brown tumors (osteosarcomas). The decalcification was so advanced that the bones could be readily cut with a knife. He recognized features in this condition which distinguished it from those of osteomalacia. Since then many cases of this sort have been reported in the literature. The course is slowly progressive, with few symptoms other than bone pain, muscular weakness, and skeletal deformities and fractures. The essential pathologic findings are extensive replacement of bone marrow by fibrous tissue, rarefaction of the cortex, and frequency of giant-cell tissue and cysts. A number of observers have reported as an associated finding frequent metastatic deposits of calcium in the various organs of the body, especially the kidneys, lungs, and arteries. In a case reported by Dawson and Struthers, deposits of calcium in the form of fine granules, which in some instances became confluent masses, were present in all the internal organs and in all the tissues of the body. At first, von Recklinghausen regarded these changes as inflammatory in origin, simulating osteitis deformans, but it is of special interest that later, in a posthumous publication (1910) he classified osteitis fibrosa with the metaplastic malacias. Meanwhile, in 1904, Askanazy for the first time reported the finding at necropsy of a parathyroid tumor associated with generalized softening of the bones (osteitis fibrosa). The patient, a woman, aged fifty-one years, had complained of pains in her limbs, and had sustained multiple spontaneous fractures. No special significance was attached to the associated presence of the parathyroid tumor, although in the previous year Erdheim had suggested possible relationship between the parathyroid glands and decalcification of bones; he based the suggestion on his observations of enlargement of these glands in osteomalacia. Although at this time little was known of the function of the parathyroid glands, other than the fact, first completely demonstrated by Vassale and Generali, that removal of these bodies led to fatal tetany, the observations and discussion of Erdheim stimulated more careful search for parathyroid enlargements associated with osseous dystrophy. Thus, by 1925, Hoffheinz had reviewed forty-five reported cases of "measurable" enlargement of the parathyroid glands. In twenty-seven of these there were skeletal changes: osteitis fibrosa in seventeen, osteomalacia in eight, and rickets in two. Erdheim's interpretation of enlargement of the parathyroid glands in osteitis fibrosa, as well as in osteomalacia and rickets, was that compensatory hypertrophy was effected by the pathologically disturbed metabolism of calcium. This disturbed metabolism had been first demonstrated by Jacoby and Schrott (1912) in the discovery of an abnormally high excretion of calcium by a patient with this disease. On the basis of this conception, Mandl, in 1925, transplanted four parathyroid bodies into the abdominal wall of a man with generalized osteitis fibrosa. Since no improvement in the patient's condition followed this procedure, he explored the neck and found a parathyroid tumor. The early disappearance of the pain in the bones, the marked reduction in excretion of calcium in the urine, and the general improvement in the patient's health that followed removal of the tumor constituted the first clinical evidence that in this disease the parathyroid lesion is primary and the skeletal changes secondary. The advances thus far achieved, chiefly through clinical observations and researches, naturally evoked many questions concerning the physiology of the parathyroid glands, as well as concerning its relationship to the physiology and pathology of bones. It was already well established that these glands were specifically concerned in regulating metabolism of calcium. After removal of the parathyroid glands of the dog, MacCallum and Voegtlin (1908) found marked diminution of the serum calcium, and showed that the symptoms of tetany could be partially relieved by intravenous administration of calcium salts. These findings were later amply confirmed by Howland and Marriott (1918), who after establishing the level of concentration of calcium among normal persons (9.2 to 11.3 mg. in each 100 c.c. of serum), found a decided reduction of calcium (average 5.6 mg.) among patients with tetany of idiopathic origin. The experiments of Greenwald on parathyroidectomized dogs suggested that these glands played a definite part in metabolism of phosphorus. He observed a diminished output of phosphorus after removal of the parathyroid glands.

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*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, St. Paul, May 23 to 25, 1932.

Beyond these observations, progress in knowledge of the physiology of the parathyroid glands came to a standstill until Hanson (1924) and Collip (1925) isolated a potent parathyroid extract. When this active principle became available for experimental purposes, new facts on the physiology of the glands were rapidly brought to light. Collip showed that administration of the hormone to parathyroidectomized dogs would raise the concentration of serum calcium, with relief of symptoms of tetany; that it would elevate the level of blood calcium in the normal dog, and that repeated injections would produce hypercalcemia. The hypercalcemia thus induced was associated with symptoms of drowsiness, loss of appetite, muscular weakness, vomiting, diarrhea, failing circulation, collapse, and death. The animals became dehydrated, and their blood exceedingly concentrated. Important discoveries of the effect of parathormone on metabolism of calcium and phosphorus were made by several independent observers. After injection of toxic doses into the dog, Greenwald and Gross (1925) found, besides the hypercalcemia, great increase in the excretion of urinary calcium and phosphorus. Hunter and Aub (1926), made the important observation that when parathormone was given to patients who were under treatment for chronic lead poisoning, the level of serum calcium may be only slightly elevated; yet there is a rise in the excretion of urinary calcium to several times the normal level. Although Collip had observed, in his earlier experiments, that there is an abrupt rise in phosphorus of the blood after a certain critical level of calcium of the blood has been reached, other investigators (Brehme and György, and Reis and Aub) found that injection of parathormone was quickly followed by lowering of phosphorus in the blood. From the experiments of Albright, Bauer, Ropes and Aub, it would appear that the first metabolic changes following administration of parathormone are rise in excretion of phosphorus and fall in the value for serum phosphorus, and that the rate of excretion of calcium and the increase in value for serum calcium are more sluggish. Other phenomena of overdosage were the production of myotonia and the occurrence of deposits of calcium widely distributed over the body, especially in the kidneys, lungs, heart, and so forth. The negative calcium balance induced by injection of parathormone naturally led investigators to presume that the extra calcium must be derived from the bones, and in 1929, Bauer, Albright, and Aub showed that the trabeculæ became diminished following long-continued administration of parathormone to rabbits. However, they found no gross effect on the cortex of the bone. In the meantime, other cases of osteitis fibrosa were studied, and when disturbances in metabolism of calcium and phosphorus were found comparable to those produced by administration of parathormone, the similarity between the two conditions was at once recognized. When the concentration of serum calcium and serum phosphorus in these cases was restored to normal by removal of parathyroid tumors, then evidence of the parathyrogenic origin of generalized osteitis fibrosa became convincing.

Although all the features of generalized osteitis fibrosa except the characteristic lesions in bone had been produced experimentally by administration of parathormone, absolute proof of the endocrine origin of the condition was still lacking. However, the final proof was soon furnished by two independent groups of investigators: In 1930, Jaffe and Bodansky were able to inject Collip's parathormone into puppies in increasing amounts for a long period of time without fatal results. "These injections led to progressive decalcification and resorption of the existing bone to fibrous replacement of the marrow, and to the production of other features characteristic of 'osteitis fibrosa.' " In the following year, Johnson, working under the supervision of Wilder at the University of Chicago, not only confirmed these investigations, but demonstrated that the results of prolonged administration of parathormone were not materially influenced by simultaneous administration of irradiated ergosterol, indicating, therefore, that this disease is not etiologically related to such diseases caused by deficiency of vitamin D, as osteomalacia and rickets.

Hyperparathyroidism is then the antithesis of tetany. In man it occurs spontaneously as a chronic and slowly progressive disease, caused by the excessive secretion of hyperplastic or adenomatous parathyroid glands, and manifested by the following clinical features: (1) high concentration of serum calcium; (2) low concentration of serum phosphorus; (3) abnormally excessive excretion of calcium and phosphorus in the urine, resulting in a negative balance of these metals; (4) pain and tenderness of bone; (5) hypotonia and muscular weakness; (6) radiologic evidence of generalized decalcification of the bones, with or without deformities, cysts and tumors, and (7) commonly, anemia and loss of weight. According to Hunter, the condition is reported as occurring twice as frequently among women as men; the ages at which it is most common are thirty and fifty-five years. Other symptoms observed in four cases of hyperparathyroidism previously reported from The Mayo Clinic included gastro-intestinal disturbances: anorexia, constipation, spells of nausea and vomiting and abdominal cramps without relationship to taking of food. Two patients had polydipsia and polyuria; the twenty-four hour output of urine of one of them ranged between 5 and 7 liters. In one patient profound lassitude was so prominent a feature as to constitute apparent utter indifference to surroundings. Nephrolithiasis, a not uncommon finding in reported cases, was found in two of the cases seen at the clinic. As the disease advances, muscular weakness progresses, walking or even sitting becomes difficult or impossible, and general wasting becomes pronounced. Deformities of the bones, such as compression of the vertebræ and pelvis and bowing of the legs, resulting in shortening of the patient's stature, are common and prominent features of advanced cases.

The diagnosis of hyperparathyroidism is possible only by correlation of symptoms and the laboratory findings. Evidence of increased rate of metabolism of phosphorus and calcium, and of generalized osteoporosis, in a case in which there are signs of bone pain, hypotonia, and muscular weakness, furnish absolute proof of the diagnosis of this syndrome. Increased concentration of serum calcium, and reduced concentration of serum phosphorus are of great diagnostic importance. In Hunter's review of thirty-two cases in which there was satisfactory proof of the presence of hyperparathyroidism, the value for serum calcium varied between 12.6 and 23.6 mg. in each 100 c.c., and the value for serum phosphorus between 1.0 and 2.7 mg. in each 100 c.c. As hypercalcemia has been reported to occur in association with other diseases, such as gout and polycythemia vera, and following ingestion of irradiated ergosterol, its presence is therefore not distinctive of hyperparathyroidism. On the other hand, it is possible in this disease for the value for serum calcium to be within the accepted range of normal, or only slightly elevated. The increased output of calcium in the urine would appear to be of greater significance in estimating the rate of metabolism of calcium than the level of the serum calcium, for it is recalled that both Hunter and Aub, and Johnson and Wilder, after administering parathormone to man, observed only a slight rise in the value for serum calcium, while excretion of calcium in the urine rose to several times the normal level.

Roentgenologic evidence of generalized decalcification of bones is of extreme diagnostic value. Camp has described these changes as a uniform, miliary, granular mottling, best observed in the skull, thinning of the trabeculæ and cortex, and the presence of areas of subperiosteal absorption in the long bones and phalanges. In addition, there may be single or multiple cysts, deformities and fractures. Apparently these changes are characteristic of the disease, since in three of four cases it was possible for Camp, on the basis of these features alone, to suggest the possibility of hyperparathyroidism before the diagnosis had been otherwise suspected. Since the symptoms, as well as any evidence that can be obtained in the usual examination of the patient in the early stage of this disease are not distinctive, it is apparent that without some suggestive clew the diagnosis may be readily overlooked. Since it is not practical to have complete metabolic studies of all patients who present more or less vague symptoms of weakness and bone pain, I am confident that in the future the unsuspected radiologic evidence of generalized osteoporosis discovered in the usual roentgenologic examination will constitute, in many cases of this disease, the first clew to the diagnosis.

In considering the operative treatment, it is important to emphasize three errors which the surgeon is likely to commit:

1. The difficulty of finding a tumor may be exceedingly great, owing to the wide variation in distribution of such tumors, and if a tumor is not present on the surface of the thyroid gland, the surgeon is likely to conclude that there is no tumor, and to close the wound after removing one or more normal parathyroid glands. The situation of the parathyroid glands is not constant: they may be contiguous to the thyroid gland, anterior, lateral, or posterior, they may be embedded within the substance of the gland, or they may be separated from the gland, occupying positions outside the fascial compartment of the thyroid gland, high in the neck or down in the thorax. It is obvious, therefore, that wide exposure is demanded and that the presence of a tumor cannot be excluded until thorough search has been made in the neck, as well as in the upper mediastinum.

2. The possibility of the presence of more than one tumor must always be considered. Of the thirty-two cases in which Hunter found satisfactory proof of hyperparathyroidism, in twenty-one a parathyroid tumor was removed at operation, in two cases two parathyroid tumors were removed, and in four cases no parathyroid tumor was found at operation. Of the five remaining cases in which operation was not performed, in four, tumors were found at necropsy, in three cases one tumor, and in one case two tumors. Recently Walton reported a case illustrating these technical problems. At operation a search in the usual sites of the parathyroid bodies did not reveal a tumor, and a small mass in the lower pole of the thyroid gland was removed in the belief that it might be a parathyroid tumor. However, on section this proved to be thyroid tissue, and since its removal was not attended by any material chemical changes in the blood, Walton opened the wound five days later. He then incised the deep layer of the cervical fascia which forms the bed of the thyroid gland, and two parathyroid tumors were found and removed. One tumor was lying behind the esophagus, and a second, larger retrosternal tumor was lying in front of the second and third thoracic vertebræ. Since learning of Walton's experience I consider the chances exceedingly great that I failed to find a parathyroid tumor in the case reported by Ball. At the time when subtotal thyroidectomy was done for a hyperfunctioning adenomatous goiter I was confident that no parathyroid tumor was present, although as I now realize, my search did not extend far enough.

3. As these tumors are commonly found posterior and more or less adherent to the thyroid gland, in close proximity to the recurrent laryngeal nerve, I have found that in some instances their removal is simplified if the inferior thyroid

artery is previously ligated proximal to its entrance into the gland. This procedure will lessen the chance of bleeding when the tumor is removed, and therefore will minimize the danger of injury to the nerve.

Operative removal of a parathyroid tumor from a patient with this disease is followed by dramatic changes. Almost immediately there is a tendency toward a restoration to normal of metabolism of calcium and phosphorus. Allan's case is perhaps typical: within five hours the concentration of calcium in each 100 c.c. of serum dropped from 16.7 mg. to 14.0 mg.; within twenty-four hours, to normal, and within forty-eight hours it had fallen to a subnormal level, with evidence of tetany of moderate severity. This persisted for more than three weeks in spite of vigorous treatment with parathormone, calcium and irradiated ergosterol. Eventually the value for serum calcium rose to normal, and treatment was gradually discontinued. The rapid decrease in excretion of calcium and phosphorus was equally as marked as the changes in the values discovered on chemical examination of the blood. Tetany has often been observed as a postoperative complication, but commonly it is transient, responding quickly to treatment. It was fatal in one reported case.

The early relief of pain has been a prominent feature in many of the reported cases. Gradual improvement in health has been observed in practically all the cases, as evidenced by disappearance of gastro-intestinal disorders, by gain in weight and strength, and in some instances by ability to resume normal occupation. In many of the cases, increase in density of the bones, with diminution in the size of the bone cysts, has been noted several months after operation, whereas in others no apparent change could be detected years afterward. Improvement in the osseous lesions is slow and probably is largely dependent on the extent to which the disease has progressed at the time treatment is instituted.

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VACCINATION PREVENTS SMALLPOX: AN ANSWER TO THE ANTI-VACCINATIONIST

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VACCINATION against smallpox is an inoculation of human beings with cowpox. This means of prevention was introduced to the world by Dr. Edward Jenner of England in the year 1798, following epidemics of that terrible disease. Since that time some countries and some of our states have passed laws making vaccination compulsory. Too little attention is paid by the public to this very important subject. The public takes action and coöperates with the medical profession in being vaccinated only during or following an epidemic.

We as physicians have continuously to contend against the inertia of the people and, in addition, against a systematized program of propaganda against vaccination which is misleading and which emanates from certain cults, faddists, and misled cranks. They are teaching the people that vaccination is unclean and dangerous. On the other hand, the medical profession knows that vaccination protects against smallpox. It is, therefore, incumbent upon us, as physicians, to vigorously disseminate the truth about vaccination.

To illustrate the pernicious character of the propaganda put forth by these enemies of public health, we shall later quote in full a pamphlet recently circulated from Minneapolis, and then we shall turn back the pages of smallpox history for ourselves to the time mentioned in the pamphlet. We shall see how deliberately false such propaganda is, and we shall note the fact that both the incidence of smallpox and the number of unvaccinated persons are increasing. From this we shall come to a conclusion, and finally we will consider the remedy.

Certain accidents and sequelæ have been attributed to vaccination. Despite the large number of vaccinations, a procedure practised all over the world, there have been very few accidents therefrom. Vaccination has been blamed for many complications but it is a common human failing not to be able to distinguish mere sequence from actual consequence. People may contract tuberculosis, skin diseases, or what not after vaccination, as they may after any other incident in their lives.

An encephalitis, somewhat similar clinically to lethargic encephalitis, but pathologically said to be more like disseminated sclerosis, has been reported since 1922 in the Netherlands and in England with but scattered isolated cases elsewhere. The symptoms are said to start nine to thirteen days after the vaccination so that the disease is apparently a consequence of vaccination, but this is by no means proven. In Public Health Reports, Vol. 47, No. 30, July 22, 1932, Dr. Charles Armstrong, Surgeon, U.S.P.H.S., reviews the subject of post-vaccination encephalitis. Some 700 cases have been reported the world over during the last ten years with a 40 per cent case fatality rate, seventy-one cases having been reported in the United States. He has done some experimental work on mice which indicates that previous immunization with diphtheria toxoid prevents this encephalitis. This disease does not follow secondary vaccinations nor primary vaccinations done in infancy. The most important practical fact about this encephalitis is its great rarity compared to the great number of vaccinations done the world over, so that fear of encephalitis is no reason to let up on our vaccination efforts against smallpox.

Anti-vaccination cranks have seized encephalitis as an addition to their propaganda. They have the audacity to go to health departments, where they ask for and obtain the number of deaths from encephalitis and poliomyelitis during the previous year, and then they boldly publish the inference that all these deaths were due to vaccination. They do not, of course, investigate these deaths to see if these people had been recently vaccinated against smallpox, or even if vaccinated at all. The people who read these papers believe them, for they are easily misled.

Not long ago a child brought a printed sheet to school to show her teacher. This finally reached the city health department, and is here quoted entirely and exactly as printed:

"THE HEALTH PROTECTOR

No. 1. May 14, 1932

"The Truth About Smallpox and Vaccination in Minneapolis, Minnesota.

"Ever since Minneapolis experienced a smallpox epidemic in 1924 and 1925, the public has been given to understand that neglect of vaccination was responsible for the epidemic, and that vaccination stopped the epidemic.

"The facts regarding smallpox and vaccination in Minneapolis for a period of 32 years, from 1900 to 1931, inclusive, and in particular the facts about the 1924-1925 epidemic, are here presented for the first time.

"Vaccination was compulsory in Minnesota until 1903. In that year the compulsory law was repealed. In 1900, with vaccination compulsory, 10 persons died of smallpox in Minneapolis. In 1901 there was only one death, and in 1902 none, but in 1903 there were 10 smallpox deaths, and 17 more were recorded for 1904. According to standard medical teachings, these two years following directly after a long period of compulsory vaccination should have shown a very high percentage of immune persons and practically no smallpox, and yet they produced a total of 27 smallpox deaths.

"From 1905 to 1918, inclusive, with vaccination becoming steadily less and less each year, there were only 11 smallpox deaths in Minneapolis for the entire 14 year period, with 3 such deaths the most recorded for any one year, and 7 years showing no deaths at all from smallpox. Only 11 smallpox deaths in these 14 years during which vaccination was steadily lessening, as compared with 38 smallpox deaths during the 5 preceding years, in 3 of which vaccination was compulsory, and in the other 2 years directly following with the population largely vaccinated.

"In the fall of 1919 a general vaccination campaign was started in Minneapolis. Publicity favoring vaccination was spread through the press and from the platform, the coöperation of employers of labor was secured to have all their employees vaccinated, and our schools were used for the circulation of vaccination propaganda. This continued, until in 1923 those interested in the promotion of this wholesale vaccination gave out interviews to the press claiming that Minneapolis was one of the most thoroughly vaccinated cities in the United States, and probably in the whole world, and, because of this, one of the best protected cities against smallpox to be found anywhere.

"There were 2 smallpox deaths in 1919, none in 1920, 3 in 1921, 1 in 1922, and none in 1923, 6 smallpox deaths in these 5 years while the general vaccination campaign was under way.

"The promoters of vaccination continued their wholesale vaccination drive through 1923, and until June of 1924, when malignant smallpox in its worst form broke out in this city of Minneapolis, which the public had been told was so exceptionally well protected against smallpox by vaccination, and the most deadly epidemic of smallpox ever known in the city, the worst smallpox epidemic ever known in the entire history of the State of Minnesota rapidly developed.

"221 persons died of smallpox in Minneapolis in 1924, and there were 144 additional smallpox deaths in the city for 1925, a total of 365 deaths from smallpox in Minneapolis for the two years, *more than six times as many smallpox deaths in Minneapolis for just these two years as there were in the city during the entire remaining thirty years from 1900 to 1931, inclusive,* and bear in mind that these 365 smallpox deaths followed directly after one of the most thorough vaccination and revaccination campaigns in Minneapolis ever conducted by any city in the whole world.

"Besides these 365 smallpox deaths, more than 100 persons died of encephalitis (a form of sleeping sickness) in Minneapolis from 1919 to 1926, inclusive, during the progress of the vaccination campaign and in the two years directly following, which was an encephalitis death record for Minneapolis never before known, and there were many additional deaths from infantile paralysis. High medical authorities now frankly acknowledge that vaccination can and does produce encephalitis, and concede that it may cause infantile paralysis.

"Can anyone doubt in the face of this evidence that there are the best of reasons to believe that vaccination actually causes smallpox instead of preventing smallpox, and that vaccination breeds other diseases, and yet, in spite of a constantly increasing mass of such evidence, this dangerous process is systematically urged upon the public.

"Published by The Health Bureau, 400 Plymouth Building, Minneapolis, Minnesota.

"Note: All figures quoted were taken from the records of the Minneapolis Health Department.

"Additional copies of this number can be had for 5c each, 10 for 25c, 100 for $1.00, 1,000 for $5.00."

Let us proceed in an orderly and chronological manner to examine the statements made in the quoted article.

One of the first statements made is that vaccination was compulsory until 1903. In a sense it was compulsory but the law was not very explicit as to when such vaccination had to be done. The law was approved March 3, 1883. As found on page 1865 under chapter 101, Title 3, of the Statutes of Minnesota for 1894, the law reads:

> "That every person, being the parent or guardian, or having the care, custody, or control, of any minor or other person, shall, to the extent of any means, power, or authority of said parent, guardian, or other person, that could properly be used or exerted for such purpose, cause and procure such minor or person under control to be so promptly, frequently, and effectively vaccinated that such minor or individual should not take or be liable to take, the smallpox."

It is here submitted that the law is so worded as to be without teeth. The law did not cause vaccination to be compulsory over the state, but did act as a precedent upheld by the courts, allowing cities to pass an ordinance requiring that children must be vaccinated before being allowed to go to school. Few cities had such an ordinance and even in the cities where such a law existed, not all children were vaccinated before coming to school. Loopholes were left for "conscientious objectors." On April 20, 1903, an "act to prevent compulsory vaccination and to prevent vaccination being made a condition precedent to school attendance" was approved by the 33rd Session of our State Legislature. So at present we cannot compel a child to be vaccinated as a requisite for school except during epidemics.

The next statement of importance is that ten people died in 1900 of smallpox during a time when compulsory vaccination was in effect. Unfortunately, the records to 1901 are not now available to check up on the vaccination status of these ten, but they were probably all unvaccinated. But the records were available from 1901 to the present so Table I was carefully compiled and accurately secured from the Minneapolis Health Department records.

Table I shows that every single one of the ten that died in 1903 had never been vaccinated, and only one of the seventeen who died in 1904 had been vaccinated! And that one was a man thirty-seven years old who had been vaccinated once in early childhood. Hence the implication that because these deaths occurred right after a period of "compulsory" vaccination all of the deaths occurred in recently vaccinated people is absolutely false. Nearly all were not vaccinated! Not one was vaccinated in the true sense of the word, for, to be really vaccinated, one must have been vaccinated or revaccinated within the last seven years.

The next paragraph mentions the number of deaths from smallpox from 1905 to 1918 inclusive. During this period there were eleven deaths and only one of these in one who had been vaccinated, and she was a sixty-four year old woman who had been vaccinated in childhood! The writer of the quoted article did not know that, of course. He says nothing of the number of cases, giving only the number of deaths. Table I plainly shows that the incidence of smallpox was steadily increasing up to 1920, when there was a big epidemic of a mild type. As people became more lax in becoming vaccinated, the amount of smallpox increased. The smallpox was very mild and frightened no one into becoming vaccinated, so a fertile field for the virulent smallpox epidemic of 1924-25 was cultivated.

Table I shows that in the years from 1901 through 1909 there were 2,382 reported cases of smallpox and of these 2,177 had not been vaccinated, making a percentage of 91.4 of unvaccinated cases. During the next decade, 1910 through 1919, 92.2 per cent of the cases were in those who had never been vaccinated. The records show that nearly every one of those vaccinated had been vaccinated in "childhood" or "years ago." From 1901 through 1931, excluding the virulent epidemic of 1924-25, there were 11,722 cases and of these 10,599 had never been vaccinated, or a percentage of 90.4. When the virulent epidemic of 1924-25 is included, there were 13,130 cases altogether and of these 11,683 (88.1 per cent) had not been vaccinated.

During the last thirty years, 88.1 per cent of all the cases of smallpox in Minneapolis were in the unvaccinated. Most of the 11.9 per cent "vaccinated" had been vaccinated in childhood. Table I gives the number of cases each year who were in Status A (vaccinated within seven years), a total of 259 cases. There having been 1,447 "vaccinated" cases and only 259 of these within seven years of contracting the disease, only 17.7 per cent of the above 11.9 per cent were vaccinated in the true sense of the word. When the total number of cases for the thirty years,

TABLE I. SMALLPOX IN MINNEAPOLIS AND MINNESOTA

Year	Total Cases in Mpls.	No. Cases Never Vaccinated	Per cent Cases Never Vaccinated	No. Cases in Status "A"	Total Deaths in Mpls.	No. Deaths Never Vaccinated	Per cent of Deaths Never Vaccinated	Total Cases in Minn.	Total Deaths in Minn.
1901	361	357	98.9	0	1	1	100.0	8485	43
1902	338	318	94.1	1	0			8666	29
1903	184	159	86.3	1	10	10	100.0	4502	55
1904	188	148	79.3	2	17	16	93.8	1920	35
1905	77	67	83.3	0	1	1	100.0	2097	9
1906	85	79	92.9	2	0			1920	6
1907	484	453	93.6	2	2	2	100.0	2787	10
1908	499	480	96.2	2	1	1	100.0	6215	31
1909	166	166	100.0	0	0			1238	17
1910	410	406	99.9	0	1	1	100.0	1262	7
1911	232	223	96.1	0	1	1	100.0	1492	7
1912	424	418	98.3	1	0			2256	4
1913	253	242	95.6	1	0			2858	7
1914	159	147	91.8	0	0			1847	7
1915	175	157	90.0	0	0			1708	6
1916	155	137	88.4	0	0			1256	1
1917	1059	945	89.1	6	2	2	100.0	2827	20
1918	523	467	89.3	3	3	2	66.6	2285	7
1919	560	502	89.6	5	2	2	100.0	2448	9
1920	2177	2028	93.1	76	0			6333	15
1921	2675	2231	83.4	138	3	3	100.0	9375	25
1922	268	237	88.4	2	1	0	0.0	2270	9
1923	191	164	86.8	3	0			1950	2
1924	992	796	80.3	9	221	188	85.1	3125	307
1925	416	283	68.0	5	144	104	72.2	916	197
1926	3	3	100.0	0	0			281	0
1927	12	12	100.0	0	0			126	0
1928	18	14	70.8	0	0			130	0
1929	4	4	100.0	0	0			221	0
1930	8	7	85.2	0	0			332	0
1931	34	28	82.4	0	1	1	100.0	305	2

13,130, is considered, with 259 cases in status A, we see that but 1.97 per cent of all the cases were really vaccinated!

If we look at the columns for deaths from smallpox in Minneapolis, we see a great preponderance of "100 per cent," indicating that all that year who died had never been vaccinated. From 1901 through 1931, excepting the epidemic years of 1924-25, there were 46 deaths, of which number 43 had never been vaccinated. This means that 93.5 per cent of the deaths occurred in people who had never been vaccinated! If we include in this period the epidemic of 1924-25, the total deaths were 411, of which 335 were not vaccinated, so that 81.5 per cent of all the deaths that have occurred during the last thirty years have been in the unvaccinated! As we shall see when examining the epidemic of 1924-25 more closely, all of the people who died and had been "vaccinated" had been vaccinated in childhood. *Not once during the entire recorded smallpox history of Minneapolis has a person died who had been vaccinated within seven years.*

During the entire recorded smallpox history only 2 per cent of all the cases occurred in those who had been correctly vaccinated and not one of these died. Does this mean that vaccination protects one against smallpox? It most certainly does.

From 1901 through 1931, excepting the years 1924-25, there were 11,722 cases with forty-six deaths, which makes a case fatality rate of 0.392 per cent. This shows how mild the mild type of smallpox is. In fact it is so mild at times that anti-vaccinationists say that chickenpox causes more deaths than smallpox and that we are inconsistent in concentrating on vaccination for the more mild disease, smallpox. But these mild types known as "Cuban Itch," "Philippine Itch," and "Alastrim" may become virulent at any time. If the mildness of present smallpox lulls us into a belief in the insignificance of smallpox so that we choose not to vaccinate, we shall be caught unprotected when a virulent epidemic comes along. Witness the virulent epidemic of 1924-25 with a case mortality rate of 25.9 per cent. If in the period from 1901 through 1931 we also include the 1924-25 epidemic, we find that there were 13,130 cases with 411 deaths, making a case mortality rate of 3.130 per cent. One never knows when smallpox will become virulent.

The "Health Protector" says an intensive general vaccination campaign was started in Minneapolis in 1919 and was kept up year after year until 1923. This is a falsehood. There was no special campaign other than the usual and continuous publicity given by all health departments for vaccination. Nor did Minneapolis claim to be one of the best vaccinated cities in the whole world. How could it be with a law forbidding compulsory vaccination?

The article says that the severe epidemic of 1924-25, with six times as many deaths as the whole previous period from 1900, came directly after the most thorough vaccination and revaccination campaign ever conducted by any city in the whole world. The words "most thorough" and "any city in the whole world" are, because of their superlative degree of comparison, earmarks of a quack and acmes of falsehood. There was no such vaccination campaign. The article implies that those who contracted the disease and those who died had been exceptionally well vaccinated. The fact is, as we shall soon see, that nearly all who contracted the disease and nearly all who died had *never* been vaccinated.

In the fall of 1919 and through 1920 and 1921 a numerically great epidemic of smallpox raged. But the disease was so mild that it did not scare people into becoming vaccinated.

Then in the summer of 1924 the storm broke. Virulent hemorrhagic smallpox in its worst form broke out in Minneapolis as a part of a concomitant state epidemic. Doctors and nurses of the health department worked all day and far into the night to quarantine and to vaccinate people. They could smell the smallpox cases as they came to the doors, and they carried this odor in their memories all day. People seemed to die like flies. Hemorrhagic and confluent smallpox was the most common type, although there were many mild cases.

Anti-vaccination cranks pestered the City Health Department, the Board of Education, and the City Council to stop all our propaganda for vaccination. It was after the epidemic started, and not before, that a real intensive vaccination campaign was followed. By coöperation of the Salvation Army and City Mission officials, the employers, and the Press of the city, the idea of vaccination was put across. By means of the vaccination campaign the epidemic quickly came to an end in 1925. Most of those who contracted the disease during the epidemic were people with a small private business or who did not work for a large company. All the large stores and companies in the city would not allow anyone to work for them who had not been recently vaccinated.

One of the first deaths was that of a chiropractor. He had a large poster on his office door showing a big swollen arm with an ulcer which he said was due to vaccination, and advised one not to be vaccinated. This chiropractor gave several spinal adjustments to a man with backache and malaise. A brother of the patient later called a regular physician because he wasn't satisfied with the progress of the patient. The physician diagnosed the case and found it to be one of the severest cases of hemorrhagic smallpox that he had ever seen. The physician, who had his office in the same building as the chiropractor, hurried to the latter's office and told him that the case was smallpox and advised the chiropractor to become vaccinated. The chiropractor refused; he didn't believe in vaccination. Again the doctor saw the chiropractor but the latter continued to refuse to be vaccinated. About two weeks after his exposure to the patient, the chiropractor developed hemorrhagic smallpox and shortly thereafter died. As soon as the chiropractor became sick, his family was vaccinated at his request and the members of his family did not contract smallpox. This incident is authentic and the records can be found in the Health Department. The chiropractor would not have died had he been properly vaccinated. There was not a single case of smallpox, and, consequently, not a single death, among the physicians in the city, who were, of course, all well vaccinated.

TABLE II. SMALLPOX EPIDEMIC OF 1924 AND 1925 IN MINNEAPOLIS

Age in Years	Number of Cases In 1924	In 1925	Total for Two Years	Percentage of All Cases in Group	Case Mortality Rate	Percentage of All Deaths
STATUS "A" (VACCINATED LESS THAN SEVEN YEARS BEFORE)						
Under 1	0	0				
1 to 4	1	0				
5 to 19	5	0				
20 and up	3	5				
Total	9	5	14	1.0		
DEATHS	0	0	0		0.0	0.0
STATUS "B" (VACCINATED MORE THAN SEVEN YEARS BEFORE)						
7 to 19	5	1				
20 and up	182	127				
Total	187	128	315	22.0		
DEATHS	33	40	73		5.20	20.0
STATUS "C" (NEVER SUCCESSFULLY VACCINATED)						
Under 1	26	15				
1 to 4	59	41				
5 to 19	208	60				
20 and up	427	165				
Total	720	281	1001	71.5		
DEATHS	186	102	288		20.5	78.9
STATUS "D" (UNABLE TO GIVE HISTORY OF VACCINATION AND HAVING NO SCAR)						
Under 1	3	0				
1 to 4	7	0				
5 to 19	28	0				
20 and up	38	0				
Total	76	2	78	5.5		
DEATHS	2	2	4		0.28	1.1

For two years: 1,408 cases, 365 deaths, making a case mortality of 25.9 per cent.

"Percentage of all cases in group" obtained by dividing number of cases in that status by 1,408, the total number of cases in the epidemic, and multiplying by 100.

"Case mortality rate" obtained by dividing the number of deaths in that status by 1,408, the total number of cases, and then multiplying by 100.

"Percentage of all deaths" obtained by dividing the number of deaths in that status by 365, the total number of deaths, and multiplying by 100.

During the year or more of actual epidemic, there were 1,408 cases with 365 deaths, making a case mortality rate of 25.9 per cent. One out of four that contracted the disease died!

The Minneapolis Tribune of January 14, 1925, says in part in an editorial: "Dr. C. C. Pierce, senior surgeon of the U. S. P. H. S., has made it plain where the responsibility for the continuance of smallpox cases lies—among the 28,000 unvaccinated persons in the Twin Cities and the transients. The disease has been fearfully virulent and this has given a numerically small epidemic a ghastly significance."

During twelve or so months of actual epidemic the city spent $26,870, of which $18,270 was for vaccination tubes, and the remainder for car-running expenses, placards, salaries, etc. This means that about $2,280 was spent per month to fight smallpox. How needlessly expensive all this is! An ounce of prevention is certainly worth more than a pound of cure.

Let us now examine Table II. We see that only fourteen cases occurred among those who had been vaccinated within seven years. This was only 1 per cent of all the cases, and not a single one of these died.

It is seen from the table that in 22 per cent of all the Status B cases vaccination had been performed more than seven years before the disease was contracted. Actual check on the length of time of previous vaccination showed that the mean average of vaccination was 45 years before contraction of the disease. In the seventy-three deaths in this group vaccination had been performed many years before as shown in Table III.

TABLE III

No. of Cases	Years Since Vaccination
3	8 and 10
9	10 and 20
14	20 and 30
10	30 and 40
12	40 and 50
14	50 and 60
5	60 and 70

Five could give no definite data. One had smallpox fourteen years previous.

This means that the vaccination of those that died had occurred a mean average of forty years before. Had these people been properly revaccinated every seven years, they would not have died. Since the case mortality rate of these previously vaccinated cases was 5.2 per cent as compared to a case mortality rate of 20.5 per cent among the non-vaccinated, a person who had been vaccinated as long as forty or fifty years before had four times a better chance of living than one who had never been vaccinated at all.

Table II further shows that in 71.1 per cent of all the cases and 78.9 per cent of all the deaths vaccination had never been performed. Adding to these cases those in Status D (no scar and no history of vaccination) who were presumably not vaccinated, we see that three-fourths of all the cases of smallpox and four-fifths of all the deaths from smallpox in Minneapolis during the epidemic of 1924-25 were in those never vaccinated.

It is evident, therefore, that the smallpox cases were not among the vaccinated and the epidemic was not due to vaccination, as the writer of the "Health Protector" implied. In fact, we must draw the conclusion that the epidemic would have been much greater in size and severity had there not been as many people vaccinated in the city as there were. There were 173 cases among school children, this being 12.2 per cent of all cases in the epidemic. Examination of the vaccination status of these 173 children showed that 97.1 per cent had never been vaccinated or could give no history of vaccination. This certainly tells us that the school child, and preferably the preschool child, should be protected by vaccination. However, smallpox prevailed at the rate of 3.7 per 1,000 among the general population exclusive of the school children, and only at a rate of 1.6 per 1,000 among the school children, which latter group was one-fifth of the general population. The case death rate was 30 per cent in the adult population and only 1.79 per cent in the school-child group during the school year from September, 1924, to June, 1925, as records from the Hygiene Department of the Board of Education show. At that time the figures favored the unvaccinated child as compared to the unvaccinated adult.

The State Board of Health's pamphlet, "Minnesota's Experience with Smallpox," shows a parallel history. During the ten years previous to the outbreak of the 1924-25 epidemic, from 1913 through 1923, there were 35,152 cases and 108 deaths. In Status A (vaccinated within seven years) there were 586 cases with *no deaths*, making 1.7 per cent of all cases. In Status B (vaccinated over seven years before) there were 1,458 cases, making 4.1 per cent of all cases, with but one death. In Status C (never successfully vaccinated) and Status D (no history of vaccination and no scar found) there were 33,108 cases, making 94.2 per cent of all cases with 107 deaths. Practically 95 per cent of all the cases and 100 per cent of all the deaths were in people who had never been vaccinated!

During the malignant epidemic from January 1, 1924, to August, 1925, the State Board of Health says there were 4,041 cases with 504 deaths in the State of Minnesota. There were 72 cases or 1.78 per cent of all cases in Status A, 527 cases or 13.04 per cent of all cases in Status B, 3,025 cases or 74.86 per cent in Status C, and 417 cases or 10.32 per cent of all cases in Status D. Therefore, 85.18 per cent (Status C and D) of all cases were unvaccinated. The percentage of unvaccinated in the state was similar, therefore, to the percentage in the city. In the group of 504 fatal cases, one death, or 0.20 per cent of all cases, was in Status A, and this death was in a fourteen year old boy with Hodgkin's disease who had previously been given but one year to live. In Status B there were 88 deaths or 17.46 per cent of all deaths; in Status C there were 391 deaths or 77.58 per cent of all deaths, and in Status D there were 24 deaths or 4.76 per cent of all deaths. The distribution of deaths as to vaccination status in the State also agrees closely with that in the city. It is noticed that more than three-fourths of all the deaths were in the unvaccinated, and there were no deaths from smallpox in anyone vaccinated within seven years (if the anti-vaccinationists will allow us to discount the Hodgkin's Disease case).

In the entire State of Minnesota from 1901 through 1931, not including the epidemic of 1924-25, it is found from Table I that there were 79,387 cases with 363 deaths, making a case mortality rate of 0.457 per cent. It will be remembered that the Minneapolis rate for this chiefly mild type of smallpox was 0.392 per cent, a close agreement. When the epidemic of 1924-25 is included in the above period it is found that there were 83,428 cases with 867 deaths, which makes a case mortality rate of 1.03 per cent for the State. The case mortality rate for Minneapolis during this entire period was 3.130, the greater rate being due to the fact that during the epidemic of 1924-25 Minneapolis had 1,408, or 34.6 per cent, of the total of 4,041 cases in the entire state, and 365, or 72.2 per cent, of the total of 504 deaths in the state.

Our examination of the "Health Protector" now brings us to the statement that over 100 persons died in Minneapolis of encephalitis (a form of sleeping sickness) in 1919 to 1926 during the progress of an intensive vaccination campaign, and the implication that these were caused by the vaccinations. As has been said, there was no such intensive vaccination campaign. It is noticed that he speaks of encephalitis as "sleeping sickness" and, therefore, he no doubt has reference to "encephalitis lethargica," which is ordinarily known as "sleeping sickness." Any quotation of lethargic encephalitis figures to mean post-vaccination encephalitis would certainly be erroneous because the two conditions are not the same. He would have to prove that the persons who died of encephalitis lethargica had been vaccinated ten or fourteen days before death to allow him to substitute the words "post-vaccination" for "lethargica." Since the writer of that article could not have been allowed to look over death certificates, which are entirely private and confidential, he could not, of course, look up these cases. But, since the writer of *this* paper comes in daily contact with these records, he looked up the 100 sleeping sickness deaths. It was then found that there was not a single death from encephalitis lethargica (sleeping sickness) from 1919 to 1925 because the classification encephalitis lethargica was not used as a cause of death until 1925. In 1925 and 1926 there were nine cases each year. It is therefore seen that the writer of the "Health Protector" has not taken the figures for "sleeping sicknsss" from the records of the Minneapolis Health Department, as he says, but has deliberately created his own figures from his fertile imagination, and has purposely falsified the whole situation!

In all fairness it must be added that there were 67 cases of encephalitis (but not the sleeping sickness variety) during the years 1919 through 1926. Because the word "encephalitis" literally means "inflammation of the brain," a variety of brain lesions are classified under this heading. There were eight deaths under encephalitis in 1919 and 1920. In order they read as follows:

(1) "Abscess of the brain, left occipital lobe, with Terminal Meningitis, (2) "Abscess of brain with Chronic Endocarditis," (3) "Acute Encephalitis following a Fall," (4) "Cerebritis and Nerve Exhaustion," (5) "Acute Encephalitis, non-epidemic, cause unknown," (6) "Epidemic Encephalitis, contributory cause being Facial

Erysipelas," (7) "Abscess in right lobe of brain," and (8) "Encephalitis—probably Lethargus."

It was therefore evident that these cases were in no way similar to post-vaccination encephalitis and there was no use in tracing relatives to obtain a history of vaccination. We must conclude from our investigation that the "Health Protector" is entirely mistaken when it says that 100 cases of encephalitis were caused by vaccination.

At the end of the article it is noticed that each copy of the article is sold for 5 cents, 10 copies for 25 cents, etc. It would appear that all this anti-vaccination propaganda is in reality a genteel form of "racket." It is a way of making an easy living off the gullibility of the uneducated. Another anti-vaccination publication, put out by the Citizens Medical Reference Bureau, Inc., 1860 Broadway, Room 1606, N. Y. C., ends with "additional copies 5 cents each, $3.00 per hundred," and then, "Friends of the Bureau will be interested to know that it is an incorporated society and is, therefore, legally qualified to hold real and personal property and to receive bequests by will or otherwise directed to the corporation."

So much for the "Health Protector" and all anti-vaccination propaganda!

During the epidemic of 1924-25 a great number of people were frightened and they were therefore vaccinated. This saved their lives. If we look at Table I we see that after that epidemic there has been very little smallpox. Practically all cases since that epidemic have been in those never vaccinated. It is also seen that in the five years, 1926 through 1930, there has not been a single death in the entire state of Minnesota, an occurrence unprecedented in previous years. This leads to an assumption that a very large percentage of people living at that time were vaccinated, but this assumption is modified somewhat by the fact that the type of smallpox since the epidemic has been very mild in character. It is now, however, time for these people to be revaccinated. But the children who are now growing up are not being vaccinated, as will be soon shown. If this continues, we can expect a severe epidemic among the children at any time.

Under Spanish control of the Philippines and for a few years after American occupation of the Islands, more than 40,000 Filipinos died each year from smallpox. Local laboratories were created for making vaccine and finally the civil population became vaccinated. The deaths from smallpox in the native villages close to Manila were reduced from 6,000 yearly to zero while in Manila itself there was not a single death from smallpox for the seven years prior to 1914.

As the result of a general relaxation on the part of subordinate Filipino Health Officers, who were supposed to see that vaccination took place, a large unprotected population, chiefly young children, came into being after 1914. It had been a long time since anyone had seen a case of smallpox so every one felt secure. The result was that in 1918 and 1919 the Islands were visited by the most severe epidemic of modern times. Between sixty and a hundred thousand persons died of smallpox in this period, and more than 90 per cent of the reported deaths occurred in unvaccinated children.

Today we, also, have a false feeling of security. Table IV compiled from vaccination status surveys of the Minneapolis Public Schools is an accurate summary of conditions in the schools as far as vaccination is concerned. These surveys were made by the Hygiene Department of the Board of Education. It will be seen that 36.9 per cent of all the school children were not protected by vaccination or previous attack of smallpox in June, 1923. Conditions were ripe for an epidemic of smallpox. During 1924 and 1925 the epidemic raged, so a vaccination status survey was not done then, but in June, 1925, at the close of the epidemic, only 7.5 per cent of the children were not protected. Since that time the percentage of unvaccinated children has been steadily increasing so that in 1931 about 27 per cent and now in 1932 about 31 per cent of all public school children are unprotected. This condition is paralleled in the parochial schools, 26.2 per cent being unprotected. The table further shows that the percentage of risks has been increasing mostly in the elementary grades, for in the public schools 43 per cent, and in the parochial schools 37 per cent, of the children in the elementary grades are unprotected. Over one-fifth of the population of Minneapolis is school children, and one-third of this group is not vaccinated! Conditions are certainly ripe for a smallpox epidemic among the children. The fact that the younger children are not being vaccinated indicates the presence of a general indifference on the part of parents toward vaccination. Surveys show that over 95 per cent of Minneapolis children in the kindergartens are not vaccinated.

The people now know very little of the horrors of smallpox, and have forgotten the cruel lessons of their forefathers. In consequence, the United States has the honor of being third from the top in the yearly number of smallpox cases, being next to the backward countries of India and Older Russia. In the period 1919 through 1924 the United States had 370,000 cases of smallpox, which is five times as much as Norway, Sweden, Denmark, Belgium, Austria, France, Germany, England, Czecho-Slovakia, and Italy combined. It has well been said that these are statistics of which every moron in our country ought indeed to be proud. The Scandinavian countries have the least smallpox because they have compulsory vaccination.

TABLE IV. VACCINATION STATUS SURVEYS OF MINNEAPOLIS SCHOOLS

PUBLIC SCHOOLS FOR TWELVE YEARS

Type of School	Percentage Risks in 1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	Total No. of Students in 1932
Elementary	37.4	38.1	37.9	39.7		11.0	11.62	11.64	14.23	21.36	35.0	43.0	48,459
Junior High			32.1	29.5		15.1	5.50	5.85	6.53	7.18	11.0	10.0	11,958
Jr.-Sr. High	23.9	27.8	26.3	26.6		18.0	7.87	6.48	6.94	6.78	11.0	10.0	3,790
Senior High	36.0	37.5	38.9	31.5		16.6	3.30	5.66	6.33	6.54	10.0	9.0	12,030
Vocational										6.31	15.0	10.0	1,324
TOTAL IN ALL PUBLIC SCHOOLS	36.6	37.2	36.9	37.0	7.5(?)	14.0	10.18	7.39	11.78	13.12	27.0	31.0	77,561
Highest Risk in Any School	48.6	60.0	71.0	77.7		43.0	39.0	27.92	38.88	99.5	78.0	87.0	
Lowest Risk in Any School	15.8	14.1	29.0	11.7		0.0	1.42	1.32	3.47	0.39	2.0	6.0	

PAROCHIAL SCHOOLS FOR 1932

Kindergarten through Grade 4	50.2	4,338
Grade 5 through Grade 8	23.3	3,952
Total Elementary Grades	37.47	8,340
High School	14.7	144
TOTAL IN PAROCHIAL SCHOOLS	26.2	8,484
TOTAL IN ALL MINNEAPOLIS SCHOOLS IN 1932	30.0	86,045

In the American Journal of Public Health (Vol. 2, 1921), Dr. J. N. Foce showed that in California, a state generally known as a haven for anti-medical cults and faddists, the opponents of vaccination have succeeded in developing a school population 80 per cent unprotected against smallpox. This fact is reflected in the number of cases of smallpox. From 1919 through 1924 California had 25,651 cases of smallpox, while during the same period Massachusetts, with a larger population but protected by a well carried-out school vaccination program under that State's compulsory vaccination law (the first one passed in this country), had only 126 cases.

In the August, 1932, number of the same publication, some facts are quoted from the Metropolitan Life Insurance Bulletin (13:4-8, May, 1932). It is stated that the three Pacific Coast States are infested with anti-vaccination cults and are, because of anti-vaccination propaganda, poorly protected against smallpox, while the Atlantic Coast States are well protected in comparison because of vaccination programs. A comparison of these two groups of states showed that in 1931 there were reported three times as many cases of smallpox (3,421) in the Pacific Coast States as there were in the Atlantic Coast States, although the population of the former was only one-sixth of the latter. In fact, the article goes on to say, there were more smallpox cases (1,112) in the single state of Washington, with a population of but 1,589,000, than occurred among the 48,900,000 inhabitants of the whole Atlantic Coast. It is therefore seen that a well carried out program of vaccination definitely prevents smallpox.

Scarcely do we begin to learn a little when Death intervenes before we can profit by experience. Must each of us, including our legislators, live to be a hundred and go through several severe epidemics before we see the necessity of compulsory vaccination? Can we not learn from the past that those who are not vaccinated may die from smallpox while those who are properly vaccinated will not die? Why do we have this easily eradicated disease among us? It is certain that future generations will not countenance the presence of smallpox in their communities. We have the knowledge and power to forever wipe out this disease. What are we afraid of? Let us consider the matter seriously and then assist the general public to draw up an act and have it passed to the effect that every child must be vaccinated before he or she can attend school. About fifteen of our states have such statutes. And while we are about it, let us include vaccination against diphtheria.

We must come to the conclusion that voluntary vaccination is a failure. As a remedy, vaccination and revaccination should be compulsory in all states. Let us draft a model law, and, when the time seems best, go to our Legislature and urge that compulsory vaccination be adopted by law.

We have here seen that the history of smallpox in the city of Minneapolis has been parallel with that in the entire State of Minnesota. It is reasonable, therefore, that under the same Anti-Vaccination Law now in force, the State has a similar percentage of unvaccinated children to the percentage in Minneapolis. If it is true that one-third of all the school children and also a large unknown fraction of the adults in the State are not vaccinated, it is easy to see that an epidemic of smallpox once started would sweep over the State like wild-fire. This is indeed a serious situation, which we must soon remedy.

Until we obtain a compulsory vaccination law in Minnesota, we must do the best we can without it. The investigation here presented makes it plain to us that what we now need is a State-wide vaccination status survey of all school children, followed by an intensive State-wide vaccination campaign. This would not be hard to do. The State Department of Education and the State Board of Health could together do this very easily on a small amount of money appropriated for this purpose by the State Legislature.

By gradually educating the people to the value of vaccination, the time will come when compulsory vaccination will be demanded by the general public itself. Until that time, since we are all public health officers, be we physicians, legislators, or private citizens, each one of us should urge every child and adult with whom we come in contact to be promptly vaccinated and revaccinated as a protection against smallpox and against diphtheria. May it be said of our generation that although we were surrounded by false prophets and misguided propaganda we were yet able to see our way clear to protect that vast body of people which is not yet born. These future people will soon be among us. They have a right to live. Each one of us should be so well protected that we can not hand on to them when they are born any of the diseases that are preventable by vaccination.

FACTORS OF SAFETY IN EMERGENCY ABDOMINAL SURGERY*

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PERHAPS first among the factors of safety in acute abdominal surgery should be mentioned the treatment of shock. This was revised and advanced more during the World War than at any other period in medical history. The researches of Bayliss and others proved to be a great advance in treating wound shock and preparing wounded men for operation. Bayliss introduced 6 per cent solution of acacia, which has the same viscosity as whole blood and the same osmotic pressure, due to colloids, as plasma, as a substitute for whole blood in maintaining blood volume. In shock, with or without hemorrhage, there is reduction in blood volume, which is more severe when hemorrhage is present. Recently, Walker and Keith demonstrated that in the experimental animal whose blood volume had been reduced by repeated hemorrhages, it was fatal to restore it by infusions of saline or dextrose solution, but when 6 per cent solution of acacia was substituted, blood volume was restored and the animals remained well. The same situation can be remedied clinically by transfusion either of whole or of citrated blood, but it is not always easy or convenient to perform emergency transfusion. According to Keith, clinical observation and physiologic studies, made in the course of the World War, proved that in cases of profound shock, with or without hemorrhage, there was partial suspension of the circulation, associated with actual decrease in the volume of circulating blood, and that the diminished volume of blood bore definite relationship to the severity of the patient's condition, but not to the actual amount of blood lost by hemorrhage. In other words, marked drop in plasma volume occurs in cases of severe traumatic shock, and unless this volume is restored by blood or acacia, death ensues in a great many cases. Patients with traumatic shock, who ultimately recover without intravenous medication, but who have been given the benefit of supportive measures such as external heat, shock enemas, and intramuscular stimulation, demonstrate gradual restoration of blood volume and plasma volume. It can be definitely stated that in cases of shock in which there is no increase in volume of plasma, recovery does not take place. This evidence is sufficient to emphasize the importance of aiding early restoration of plasma in every possible manner. Solution of acacia satisfies all requirements for restoration of blood volume and equilibrium between the fluids of the blood vessels and the tissues, but the manner in which it is done is not definitely understood. The advantages of acacia are as follows: it can be used in place of blood in cases in which blood volume has decreased from shock or hemorrhage, or both, to not more than 50 per cent of the total amount of blood in the body; it can be prepared and kept as a stock solution; it is more economical than blood transfusion and frequently is a life saving procedure in emergencies.

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*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Section of Surgery of the Minnesota State Medical Association, Minneapolis, Minnesota, May 23 to 25, 1932.

The use of acacia has not received the attention in the small hospitals that it deserves. This no doubt has been due to its supposed toxicity. There have been many unfavorable reactions from its use, as shown by Hanzlik and Karsner, but these were due to impurities, and a pure, nontoxic solution of acacia can be produced. The method of preparation of a pure nontoxic solution as outlined by Osterberg at The Mayo Clinic is the following: The acacia must be in the form of lumps (pearls), number 1, extra quality. A solution of twofold strength is first prepared, and then diluted to the required degree of concentration with freshly distilled water. Eight liters of the solution are prepared in the following manner: after weighing, 480 gm. of acacia and 72 gm. of sodium chloride are placed in a beaker of a capacity of 4 liters, and approximately 500 c.c. of triple-distilled water is added. The acacia is extracted again by heating it on a steam bath and pouring off the supernatant solution. This extraction is repeated until all the acacia is dissolved. It is important to add only a small amount of water at each stage, for the acacia goes into solution more readily when the lumps rub against each other freely and are not caked. The solution is then made up to a total volume of 8 liters, contained in a Pyrex flask of a capacity of 12 liters. This turbid solution, containing some impurities, is sterilized in an autoclave for periods of one hour on four consecutive days. Sterilization results in precipitation of some flocculent material, which is objectionable. Attempts to get rid of this precipitation by filtration and resterilization of the filtrate are of no avail, since each heating results in further precipitation. It is best to siphon off the clear solution that lies above the flocculent precipitate, under sterile conditions, into sterile bottles. These bottles, containing approximately 800 c.c. of the solution of acacia, are stoppered tightly with sterile plugs and gauze. Such a solution appears to be nontoxic, and remains satisfactory for intravenous injection for several months.

Convenient ampules, containing 100 c.c. of a 30 per cent solution of acacia, are now on the market. These require dilution to 500 c.c. with sterile water previous to injection, and have been found satisfactory.

Clinically, Masson, of The Mayo Clinic, in 1928, advised use of acacia, for patients who had lost considerable blood, as a postoperative factor in preventing shock. Figure 1 demonstrates the gradual increase in use of acacia and the gradual decline in use of blood transfusion during 1928 and 1929 at The Mayo Clinic. The results have been so gratifying that the material is now almost indispensable. Hoffman, of The Mayo Foundation, reported a series of 300 cases of various types of shock in which a 6 per cent solution of acacia was injected, with beneficial results in many.

The clinical picture of shock is not infrequently delayed among patients with traumatic conditions such as rupture of the spleen, although signs of internal hemorrhage are obvious, but in such cases, unless measures are taken to prevent it, shock will supervene soon after the abdomen is opened. This is particularly true if complications arise in the course of the operation that may prolong it. The continuous use of acacia, during serious and difficult operations to prevent drop in blood pressure, was shown by Adson and McIndoe in cranial surgery. I have applied this same principle in abdominal surgery with very gratifying results. The following case which I have reported is an example.[3]

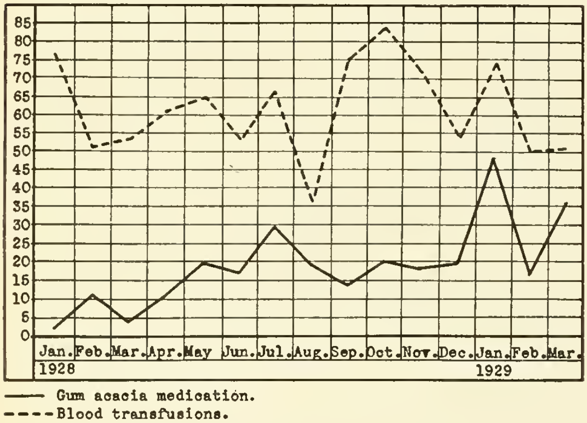

Fig. 1. Increase in use of acacia.

Case 1.—A girl, aged six years, was admitted to hospital April 11, 1931, having been knocked down and run over by an automobile. It was said that the wheels passed directly over the abdomen.

Immediate examination disclosed a bruise over the right hip, and the upper left part of the back. The abdomen was diffusely tender, but not rigid. The blood pressure in millimeters of mercury was 100 systolic and 60 diastolic. Roentgenograms of the thorax and pelvis gave negative results. About thirty minutes after admission, the child's general condition changed considerably, and the usual signs of internal hemorrhage appeared. A catheterized specimen of urine contained blood, graded 3. Leukocytes numbered 33,000 in each cubic millimeter of blood. Immediate exploration was advised.

Inspection through a left rectus incision disclosed a large amount of free and clotted blood in the peritoneal cavity. The spleen was in three fragments, from which there was free, active hemorrhage. Splenectomy was performed, and the splenic pedicle was doubly ligated. Gross evidence of injury to the bladder, kidneys, or intestinal tract was not apparent, although the catheterized specimen of urine contained blood. Apparatus for intravenous injection was set up and connected to the left median basilic vein, and 500 c.c. of 6 per cent acacia in solution of sodium chloride was administered during the operation. This was followed by 500 c.c. of citrated bood, given at the conclusion of the operation, to restore the volume of blood cells. At the conclusion of the operation blood pressure was normal, the pulse was of good quality, and the pulse rate was 100 beats each minute.

Injury to the spleen is one of the most severe abdominal injuries and frequently is fatal. Bland-Sutton has pointed out that the patient may collapse as dramatically as when an aortic aneurysm has burst. On the other hand, after the initial injury in the region of the spleen, the patient may gradually fail, with obscure abdominal symptoms, over a period of hours, days, or weeks, until the fact of progressive internal hemorrhage becomes manifest and operation is advised. It is in this latter group of cases, in which the clinical course is more prolonged, that considerable danger to life is present, by virtue of the fact that a fatal secondary hemorrhage from the spleen may occur in from a few hours up to several weeks after the primary injury. Here there is usually a period between the splenic injury and the appearance of signs of internal hemorrhage, which is called the quiescent period or period of symptomatic silence. Usually this period lasts two or three to twenty-four or forty-eight hours. Much more rarely it lasts for days or weeks, and the patient may go about his work in the belief that the primary injury is not of much importance. The silent period here is due to the practical cessation of bleeding from the injured organ. Sudden, profuse, secondary hemorrhage recurs under the stress of some slight rise in blood pressure, and is attended by the same high mortality as primary rupture unless surgery is immediately undertaken. The following case, which was previously reported by McIndoe in a study of all such cases in the literature, is typical.[15]

Case 2.—A man, aged forty-five years, was admitted to the hospital gravely ill, with the following history: ten days previously, while felling trees, he was struck a glancing blow in the left upper quadrant of the abdomen by a branch of a falling tree. He insisted that the blow was of moderate severity, that he was not knocked down, and that no external injury resulted. Almost immediately, however, he experienced a violent pain in the left upper quadrant, which lasted about ten minutes. He was then able to resume work, and continued for the rest of the day. He stated that a slight residuum of pain persisted during the day. That night it again became severe, and the next day he consulted his physician. By that time the pain had practically disappeared and nothing of note was found on examination.

Accordingly, he worked seven days more felling trees, although he still compained of a continuous, nagging pain in the injured region. On the morning of the ninth day following the original injury he was suddenly seized with a violent exacerbation of the same pain, this time extending through to the back and up to the left shoulder. He became nauseated, but did not vomit. On deep inspiration he had considerable pain at the base of the left lung. Within a short time he collapsed. In the previous nine days he had not noticed fever or any urinary abnormality. His previous history was entirely negative.

On admission to the clinic, on the tenth day after the initial injury, the man was obviously gravely ill, his skin was pale and covered with cold sweat, his eyes were lusterless, and his attention was wandering and difficult to engage. His respiration was rapid, grunting and purely costal in type; his knees were flexed on his abdomen for greater comfort. His pulse rate was 100, his temperature 99.2° F., and his blood pressure 140 systolic and 80 diastolic. His normal blood pressure was 200 systolic. Examination of the thorax disclosed, briefly, elevation of the diaphragm on both sides, particularly the left side, with fluid at the left base and a moderate amount of bronchopneumonia on both sides. There was suspicious tympany in the left side of the thorax which rather suggested the possibility of diaphragmatic hernia. The abdomen was generally rigid and tender, especially in the left upper quadrant. Here an indefinite mass could be felt, that was dull to percussion, from the seventh costal cartilage to the level of the umbilicus. This dulness did not shift. Rectal examination was negative. The urine was negative. The blood findings were those of severe secondary anemia. The concentration of hemoglobin was 48 per cent, erythrocytes numbered 2,720,000 and leukocytes 25,000 in each cubic millimeter of blood; the differential count was normal. The diagnosis was that of concealed abdominal hemorrhage, probably from ruptured spleen, with a further possibility of a diaphragmatic hernia of the left side. After further surgical consultation, it was thought advisable to observe the patient for twelve hours and to combat the severe dehydration from which he was suffering by subcutaneous injection of saline solution. The next day it was obvious that the patient's condition was worse, and immediate operation was advised.

Under local anesthesia supplemented by ethylene the abdomen was opened by a wide transverse incision in the left upper quadrant. Blood was immediately encountered inside the peritoneum. Further exploration revealed a huge hematoma, consisting of old, black clots and recent fresh hemorrhage, extending over the stomach from the transverse colon below to the left dome of the diaphragm above. It probably contained about 2 liters of blood. Next was encountered a piece of spleen about 10 cm. in diameter, attached by a fragment of what was taken to be the remains of the splenic pedicle. There were no blood vessels, however, to be noted in this piece of capsule. The remainder of the spleen, in five separate pieces (Fig. 2), was then found loose in the blood clot and held together by it. The splenic pedicle appeared to be entirely free, but no active hemorrhage was occurring from it. The whole mass was quickly removed from the abdomen, and three clamps were placed across the splenic pedicle as a protective measure. A few bleeding veins on the greater curvature of the stomach were ligated. The cavity was packed with iodoform gauze and the abdomen was closed. Transfusion of 500 c.c. of citrated blood was given on the table, and immediately the patient was placed in an oxygen tent, where he remained forty-eight hours. The clamps were removed at the end of this time, and the packing in seven days. A rubber tube was then inserted, and was pulled out a little daily, until the cavity was obliterated. Convalescence was uneventful, and the patient was up and about on the sixteenth postoperative day.

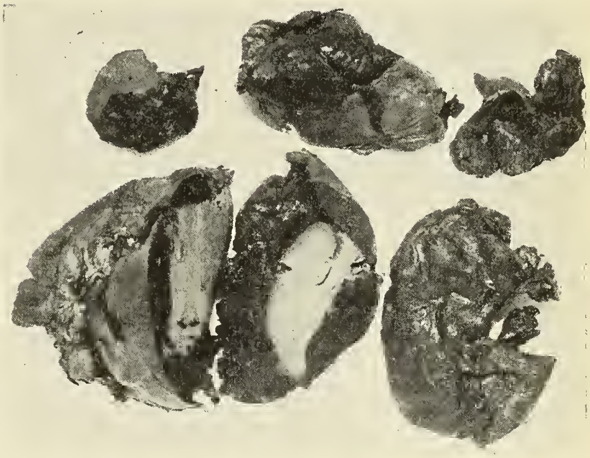
Fig. 2 (Case 2). Five fragments of spleen.

There are numerous reports in the literature of the spleen being ruptured by insignificant injuries to the splenic region, and fourteen cases have been reported as occurring from falls out of windows, from ladders, from a balcony, and into cellars or pits. If such injury is suspected, the physician should urgently request that the patient remain in bed ten days to two weeks for daily observation. It is to the local symptoms and signs, however, that the closest attention should be paid, for it is here that the only definite evidence of splenic injury is to be found. Pain over the region of the spleen is almost constant. It varies in intensity from mere discomfort to severe pain of great intensity, requiring the patient to lie down. Rigidity of the abdominal wall over the splenic region (Fig. 3) is always present, and is diagnostic of peritoneal irritation. Hartmann first established the diagnostic significance of abdominal rigidity, and stated that in the absence of all other symptoms, contraction of the abdominal wall, not limited to the place of injury, was a clear indication for immediate laparotomy. On the other hand, when it was absent, he refrained from intervention. His contention was strikingly supported by the statistics of Mauclaire and Roger derived from twenty-seven cases of abdominal contusion, in ten of which there was muscular rigidity and in seventeen none. Of the former group of patients nine were operated on, and in each case a ruptured viscus was found. One patient refused operation, and died from peritonitis from a ruptured bowel. All of the latter group of patients recovered without operation. Persistent abdominal rigidity then, in the left upper quadrant of the abdomen after slight injuries in this area, should cause one to suspect underlying splenic injury.

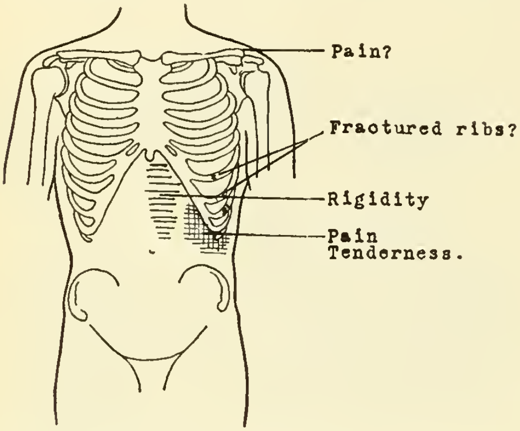

Fig. 3. Local signs and symptoms in splenic injury.

GUNSHOT WOUNDS OF THE ABDOMEN

Since these injuries are becoming more common in civil life, any suggestion regarding surgical treatment that results in lowered mortality is welcomed. These accidents previously occurred mainly in larger cities, but in recent years they have taken place in rural communities, so that it is essential for physicians practicing in these communities to be familiar with such emergencies.

Gunshot wounds of the abdomen obviously should be treated early. Military opinion, as a result of experience in the World War, turned in favor of operative treatment, although previous military experience had seemed to indicate that not to operate was the safer course. However, occasionally a patient with a gunshot injury of the liver, or with a gunshot wound of the pelvis, survives without operation, but as a rule, under present conditions, there is little to be said for expectant treatment. Of three patients seen at The Mayo Clinic, two with injuries to the intestine were submitted to operation and one with injury to the liver was not operated on. All three recovered. Two of these cases have been reported before. Briefly, the findings and surgical procedures were as follows:

Case 3.—A girl, aged eighteen years, was admitted to hospital February 2, 1930, five hours after receiving a gunshot wound in the abdomen. The weapon was a 38-caliber revolver. Immediately after the injury she had walked about 50 yards. Her left leg then had become too weak to bear her weight, and she had crawled for a half mile, dragging the left foot.

The bullet wound was found in the right flank, but the point of exit was not found. The abdomen was diffusely tender and moderately rigid. The left thigh was maintained in flexion, and any movement of it caused pain in the region of the left hip. A roentgenogram disclosed the bullet in the inner aspect of the left thigh, 2.5 cm. below the lesser trochanter. The temperature on admission was 100.4° F.; the pulse rate was 112 beats each minute and the blood pressure was 125 systolic and 75 diastolic.

Operation was performed under ether anesthesia six hours after the injury. For satisfactory exposure, an incision was made in the median line, extending above and to the right of the umbilicus. There were two large holes in the ascending colon, just above the cecum, and thirteen holes of varying sizes throughout the ileum. A hole 2.5 to 3 cm. in diameter was torn in the sigmoid. The abdomen was filled with blood and intestinal content. The patient went into a state of shock, the pulse rate varying around 160, shortly after the operation was begun. This was combated by intravenous injection of 1,000 c.c. of 6 per cent solution of acacia. In view of the fact that there was no destruction of the blood supply in the mesentery to the bowel, it seemed best hurriedly to close the perforations. An enterostomy tube was then placed in the ileum to relieve pressure by gas and protect the suture lines. The hole made by the bullet at exit was found in the left side of the pelvis, just under the round ligament. The bullet could not be palpated through this opening. The peritoneal cavity was washed out repeatedly with warm saline solution, and aqueous solution of mercurochrome was used freely over the perforations. One Penrose cigarette drain was placed along the cecum, and one along the sigmoid for drainage. Tetanus antitoxin, 1,500 units, was given intramuscularly.

The ileostomy tube was removed on the thirteenth day after operation, and the drains were removed on the thirteenth and fifteenth days. The patient was out of bed on the thirty-seventh day, and left the hospital three days later, with the wound well healed.

Case 4.—A boy, aged thirteen years, was admitted to hospital July 8, 1931, about two hours after receiving a wound from a 22-caliber rifle in the right lower part of the abdomen. The bullet entered just below and to the right of the umbilicus and passed out through the right iliac bone. The patient felt nauseated and faint, and vomited once, but the blood pressure remained normal. The lower part of the abdomen became generally tender and rigid and there was increasing pain in this region. Immediate surgical intervention was advised. The abdomen was opened through a right rectus incision. A loop of ileum, approximately 30 cm. from the ileocecal valve, was found to have two perforations. These were closed with chromic catgut. There were also three holes in the mesentery, which were similarly closed. No blood vessels of the mesentery were injured. The abdomen was cleansed with saline solution. One Penrose drain was placed so that it extended down to the cecum and the wound was closed. Convalescence was uneventful, and the patient was dismissed from hospital on the twentieth postoperative day.

Case 5.—A man, aged twenty-two years, was admitted to hospital October 25, 1931, forty-five minutes after receiving a gunshot wound from a 22-caliber rifle. While he was getting into a car, the gun accidentally had discharged, the bullet had struck at the right costal margin, and could be palpated just beneath the skin of his back. The point of entrance and the point at which the bullet could be palpated indicated that it had passed through the right lobe of the liver. There was evidence of marked shock, the blood pressure was 90 systolic and 45 diastolic, later dropping to 80 systolic and 25 diastolic. The right side of the diaphragm was elevated, and the abdomen generally was rigid. The thorax was clear.

It was safe to assume, from the direction and course of the bullet, that the intestinal tract had not been injured. The patient was given general measures for shock, without any intravenous medication, because it was essential to keep the blood pressure down for a few hours to a level compatible with life, as an aid to checking of hemorrhage. The injury was in such a situation that surgical intervention aimed at control of bleeding would probably have been futile. The blood pressure gradually returned over a period of three days and all evidence of bleeding ceased. Further convalescence was uneventful (Fig. 4), and the patient left the hospital on the tenth day following admission with the bullet still in his back.

The points to be stressed in Case 3 which undoubtedly were valuable contributing factors in recovery were the use of acacia for shock, enterostomy above the injured part of the intestine, thoroughly washing out the peritoneal cavity with warm saline solution and free use of mercurochrome. The value of acacia has been considered previously, but here again it is profoundly demonstrated.

The value of enterostomy in these cases cannot be overestimated. It should be performed in every instance of extensive traumatic rupture of the intestine, for it is a safety valve for the escape of gas and of the fluid content of the small bowel, which constantly accumulates, and thereby protects the intestinal suture lines. This does not apply to injuries of the duodenum or upper part of the jejunum. From the enteric stoma, in Case 3, 1,600 c.c. drained in the first eighteen hours, and then varying amounts up to 2,000 c.c. each twenty-four hours. The patient defecated normally on the fifth day. The enterostomy tube was removed on the thirteenth day and the wound closed spontaneously soon afterward.

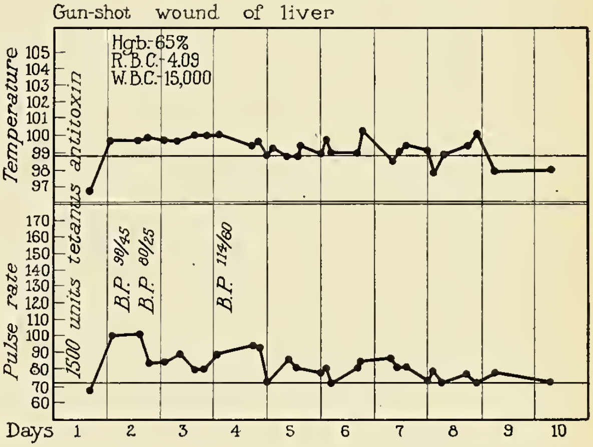

Fig. 4 (Case 5). Convalescence in a case of gunshot wound of the liver.

Thorough washing of the intestines and the peritoneal cavity with warm saline solution following contamination such as occurs in these injuries should be advocated. It is absurd to expect to sterilize the abdominal cavity by any method, but reduction in the amount of intestinal content and of blood in the peritoneal cavity should not be injurious. Metaphen, 1 to 1,000 solution, or a 2 per cent aqueous solution of mercurochrome, may be used freely in the peritoneal cavity. Although I possess no data as to the beneficial results from the use of either, I do gain a sense of security, false or otherwise, by using them. The results in this instance seem to support the belief that the measures may be of benefit.

The judicious use of adjacent omental tags of fat for protection of the suture line was advocated many years ago by W. J. Mayo. There is no doubt that a small tag of fat, sutured over the line of closure of an opening in the large intestine, has prevented the death of many patients from general peritonitis. The principle is utilized in operations on the renal pelvis, ureter, and biliary tract, in plastic operations on the pyloric end of the stomach and duodenum, and to cover the dangerous angles following resection of the stomach. The value of this phase in technic is not generally recognized.

Case 4 is of interest on account of the lack of shock, which can be attributed to the slight loss of blood and the relatively small amount of visceral trauma and contamination. The value of early surgical intervention is demonstrated.

Case 5, in which operation was not performed, is an example of the value of constant observation of a patient who is in shock from hemorrhage but whose blood pressure should be kept low as an aid to control of internal bleeding that is taking place in a situation that would be most difficult to control surgically. It was planned to give small amounts of 6 per cent solution of acacia intravenously, should the systolic pressure drop below 70. This point is considered the lower limit, if too serious consequences are not to supervene.

Operation in gunshot wounds of the abdomen involving the intestinal tract in which there is considerable soiling and hemorrhage, must be performed with dispatch. The type of operation necessary can be determined only at the time of exploration, and will depend on the nature and amount of trauma. If the blood supply to an intestinal loop has been destroyed, resection is the only choice. If the mesenteric side of the bowel has not been injured, the perforations can be closed without obstructing the lumen of the bowel, as in Cases 3 and 4.

ACUTE INTESTINAL OBSTRUCTION

So much has been written on this subject within the last few years that I hesitate to direct attention to it here. The mortality rate throughout the country is approximately 45 to 65 per cent, however. Therefore, considerable work remains to be done; the public must be taught to seek surgical care earlier, and physicians must keep constantly in mind the factors which have been proved experimentally and clinically to be of distinct benefit in combating this condition. There is no other acute abdominal condition in which recovery depends so completely on early surgical intervention. Perhaps the greatest single step in progress was the discovery that the value for plasma chlorides was reduced, that there was increase in the carbon dioxide combining power of the blood plasma, and that there was retention of the nonprotein nitrogen and urea nitrogen in the blood stream. Haden and Orr, in 1923, reviewed these changes in chemical values of the blood in cases of experimental obstruction, and advised use of sodium chloride solution intravenously in combating the disease. Dixon, in 1923, called attention to the beneficial results from use of sodium chloride in obstruction of the upper part of the intestinal tract, and that preoperative administration of saline and glucose solution made it possible to carry out surgical procedures with minimal risk. Walker and Keith, in their dehydration experiments on animals, pointed out the advisability of restoring fluid to the tissues generally in the form of isotonic solution of sodium chloride or dextrose.

Another progressive step in treating this condition was made by Dragstedt. He isolated a segment of intestine, closed both ends, and reestablished the continuity of the intestinal tract by end-to-end anastomosis. Under these conditions, the blind loop became very markedly distended; if distention increased, the classical symptoms of intestinal obstruction developed, and in addition, alterations in chemical values of the blood were noted. If the content of the closed loop was aspirated, improvement immediately followed, and the chemical values of the blood returned to normal. When saline solution was administered intravenously, also, the animals lived several days, but if treatment was not given they died in twenty-four to forty-eight hours. The inference was that a toxic substance was absorbed from the injured mucous membrane of the closed loop. If this assumption is correct, as it seems to be, then in acute intestinal obstruction there is not only dehydration toxemia from vomiting but also toxemia from absorption of certain unknown substances from the injured bowel. In this connection, Wangensteen and Chunn showed that the substances above and below the obstruction were equally toxic.

Judging from the foregoing evidence, it is clear that the most important factors in the treatment of acute intestinal obstruction are to combat the dehydration with saline and sugar solutions and to release the obstructed intestinal content. Surgical intervention in these cases, without preoperative preparation with saline and glucose solution, especially if the obstruction has lasted three to four days, as it often does, results in extremely high mortality. When the obstruction is only partial, or of only a few hours' duration, exploration and repair generally can be effected without preoperative preparation.

A Wetzel type of enterostomy is the operation of necessity in cases in which obstruction has lasted forty-eight to seventy-two hours. It should be performed just above the obstruction to secure adequate drainage of the obstructed loop. In the presence of extreme toxemia, it is advisable to follow the suggestion of Wangensteen and Chunn, that the loop of bowel just beyond the obstruction be drained by a second enterostomy. The tubes should be brought out through the omentum, and through stab wounds in the abdominal wall. The omentum practically prohibits any chance of leakage around the tube, and in addition facilitates closure of the opening in the bowel in two to five days when the tube is removed. Further exploration to seek the cause of the obstruction in delayed cases is almost certain to produce general peritonitis and death. It is a bad practice to explore at the expense of the patient's life. It is not uncommon to have the obstruction correct itself following enterostomy. When this does not follow, secondary operations can be postponed until the physiologic balance of the organism has been restored sufficiently.

Gastric lavage immediately before surgical intervention is a valuable adjuvant to a successful issue. Patients have, in fact, been known to drown by vomiting and aspirating a large amount of their gastric content while under either general or spinal anesthesia. It is remarkable how quickly a stomach is filled by means of reverse peristalsis, especially if the patient has been vomiting repeatedly.

Spinal anesthesia is being employed more and more in treatment of acute intestinal obstruction. Frequently it is of distinct advantage, in that the obstruction is occasionally automatically released by contraction of the bowel. It is undoubtedly indicated in all early cases of obstruction, but in those in which it has lasted three to four days, and in which the organism is profoundly disturbed, I feel that spinal anesthesia should be used with reservation. Reaction following its use in such a patient is to be regarded as almost a fatal outcome. It is a much more prudent measure to perform enterostomy under local anesthesia, and if necessary to use a small amount of gas.

SUMMARY

The use of 6 per cent solution of acacia as a substitute for blood transfusion in the treatment of shock in emergency abdominal conditions, such as rupture of the spleen and gunshot wounds of the abdomen, is stressed. It is nontoxic, easily prepared, and can be kept as a stock solution for many months without deteriorating. It rapidly restores and maintains blood volume. If shock is produced by hemorrhage it is almost invariably fatal to restore the blood volume with solutions of saline or sugar. Continuous administration of small amounts of solution of acacia during operation, if shock is anticipated, is a distinct advance in prevention. This is particularly true in cases of delayed rupture of the spleen or in extensive gunshot wounds of the intestines or mesentery.

Patients who sustain injury over the splenic region, although the injury may seem insignificant, should be kept under observation ten to fourteen days. If there is continuous rigidity in this region, and if splenic dulness is progressing, immediate surgical intervention has been shown to be the best course to pursue.

Military opinion, as a result of experience in the World War, turned in favor of operative treatment of gunshot wounds of the abdomen. Closure of the perforations, or resection of the intestine with end-to-end anastomosis, if the blood supply to the intestine has been destroyed, are the operations of choice. If there are multiple perforations, with considerable soiling of the peritoneal cavity, it is advisable to perform enterostomy above the injured portion of the bowel, and to wash out the abdomen with warm saline solution. Metaphen, 1 to 1,000, or a 2 per cent aqueous solution of mercurochrome, may be used to advantage in the peritoneal cavity. In gunshot wounds of the right half or dome of the liver, it may be judicious to postpone surgical intervention, but continuous observation of the patient must be maintained.

In acute intestinal obstruction, the organism is profoundly disturbed by dehydration toxemia from vomiting, and by toxemia resulting from the absorption of toxic substance from the injured mucosa of the obstructed bowel. Preoperative preparation by intravenous administration of normal saline and glucose solution rapidly restores chemical values of the blood to normal, and renders the patient a much safer operative risk. Early operation is imperative when fluid balance is restored.

Spinal anesthesia is advisable in early cases and may result in spontaneous cure, but if this does not take place, immediate exploration can be done and the obstruction relieved. In delayed cases, enterostomy only is advisable, usually performed under local anesthesia. Further exploration is to be condemned.

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ACUTE CONDITIONS OF THE ABDOMEN*

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Acute abdomen, though a meaningless term, has been quite generally adopted to cover a symptom-complex that is more or less common to pathologic conditions suddenly arising within the abdomen. The entities giving rise to these confusing symptoms are, in their probable order of frequency: acute appendicitis, biliary colic, renal colic, intestinal colic, perforated peptic ulcer, intestinal obstruction, acute pelvic inflammation, ruptured ectopic pregnancy, pancreatitis, diverticulitis, mesenteric thrombosis, and torsion of the great omentum. For purposes of differential diagnoses there should be added several conditions not arising in the abdomen. They are pneumonia, pleurisy, tabetic crises, lead colic, and coronary thrombosis.

As pain is the outstanding manifestation in most acute abdominal crises, it is important to remember that pain resulting from a lesion of a viscus is not felt in that viscus itself, but is referred to the peripheral distribution of the spinal nerves arising from those segments of the cord with which that viscus is connected through its sympathetic nerve supply.

Most pain, therefore, that is felt in the early stages of an acute abdominal catastrophe is of this reflex character and is not localized to the situation of the viscus primarily at fault. Later, when the local inflammation has developed sufficiently to irritate the parietal peritoneum, the pain becomes localized at this point.

Burgess places all acute abdominal conditions into four groups: I, Colics; II, Perforations; III, Inflammations; IV, Obstructions.

I. The colics are characterized by: (1) sudden onset of pain; (2) sudden cessation of pain; (3) tendency of the pain to recur. The pain in this group is usually referred to certain characteristic regions. In biliary colic it is felt in the epigastrium, radiating backwards to the angle of the right scapula and occasionally to the tip of the right shoulder. In renal colic the pain is felt, first in the loin, then shoots down to the groin, inner aspect of the thigh and testicle. Of marked diagnostic value in connection with the pain is increased frequency of micturition and blood in the urine. In intestinal colic pain is felt more or less all over the abdomen. Lead colic differs from other intestinal colics in that the pulse during the pain is retarded, and the blue lines in the gums are present. Tenderness of the abdomen is often present in intestinal colic, but in some cases the pain is relieved by pressure. Muscular rigidity may occur in the colics, but seldom is of the unyielding character found in the true involuntary rigidity. The patient is more restless than in other acute abdominal crises.

II. Perforations are characterized by: (1) sudden onset of pain, usually excruciating; (2) the severity of the initial shock; (3) marked involuntary rigidity from the very first; (4) signs at times of free gas in the abdomen.

III. Inflammation. In this group the onset is less sudden than in the conditions already considered, and general symptoms of malaise may precede the crises by a few days. The pain never reaches its greatest intensity in the first few moments. There may be a rise of temperature in the early stage, wherein this group differs from the others mentioned. The presence or absence of rise of temperature should not, however, influence one too much in drawing conclusions and should certainly never be waited for to complete the diagnosis. There is often fairly early local tenderness (sometimes first detected in the rectum as in salpingitis and pelvic appendicitis). Muscular rigidity of the involuntary type, absent at first, appears when the parietal peritoneum becomes affected. Swelling may later appear in the region of the appendix, gallbladder, Fallopian tubes, etc.

IV. Obstructions are characterized chiefly by: (1) the persistence of vomiting; (2) the cessation of the passage of flatus; (3) progressive abdominal distention. Involuntary muscular rigidity is absent and the pain and tenderness are usually distributed more or less over the entire abdomen. As the condition progresses there is extreme distention, fecal vomiting, restlessness, pinched expression, rapid and thready pulse with profound collapse.

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If the case before us can be placed in one of the above named groups, the problem of diagnosis is at once simplified. When, however, the symptoms are indefinite or overlap as in obstruction, or perforation, developing into peritonitis, the clinical differentiation is more difficult and can be arrived at only by carefully excluding all other conditions for which it might be mistaken.

Confronted with a patient that presents evidence of something having gone seriously wrong in the abdomen, we are obliged to consider the advisability of immediate operation. To settle this question is indeed the most urgent, and often the most perplexing, problem connected with an acute abdominal emergency.

If the all-important question, whether to operate or not, is answered in the affirmative, we find ourselves face to face with another question, namely, what to do with what is found. Even though the case presents a fairly definite picture, it is seldom so clear that one can do better than operate under a doubtful diagnosis. It is evident therefore that one who undertakes acute abdominal surgery must be capable of dealing with any unexpected difficulty that may be encountered.

The time at hand permits such a limited discussion that only a few points on diagnosis, and our own method of treating the more common conditions coming under acute abdominal emergency, will be touched upon.

In a case of appendicitis, where the operation reveals a ruptured appendix with no attempt at walling off, there is at best a potential peritonitis; more likely the peritoneum is already involved to a greater or lesser degree, and needs only the additional provocation produced by manipulation during the appendectomy to hasten it into a spreading and eventually a general peritonitis. We are not in accord with the surgeon who will close the abdomen without drainage in such a case. On the contrary we often take even greater precautions than the drain alone, and do a cecostomy or an appendicostomy. By thus draining the bowel at once, permitting free escape of gas and feces, the danger of ileus, that invariable accompaniment of peritonitis, is to a great extent avoided. It permits also the instillation of fluids into the bowel in any amount that may be desired. In doing an appendicostomy it is well to insert the stem of a Y glass connection into the free end of the enterostomy tube; then longer tubes slipped over the two open ends, one extending down into a receptacle for draining liquid feces, the other hung up on a standard for escape of gas. The omentum should always be brought down around the tube where it enters the bowel, anchoring it there with several sutures. A still better method is to pull the tube through a puncture in the omentum. This will provide protection and facilitate closure when the tube is removed.

We still adhere to the belief that the badly infected cases, particularly of peritonitis, are greatly benefited by pouring ether over the involved parts. While ether is mildly antiseptic, it is not advocated so much for the bactericidal power as for its action in producing or increasing leukocytosis, thereby aiding nature in its defense against infection. In several cases of advanced peritonitis we have literally washed out the abdominal cavity with ether, using a can or more for the purpose. When more than an ounce of ether is used, the overflow collected in the pelvis should be immediately aspirated or gently swabbed out. We have not closed the abdomen without drainage where ether was used.

We believe that operation in acute cholecystitis should be restricted to the case where it seems a life-saving measure. After quite an extensive experience we are convinced that about ninety per cent of patients with acute cholecystitis will, with an ice bag, rest and restricted diet, improve to a point where a cystectomy with other necessary work can be safely done. If progress is unfavorable, then, after proper preparation such as transfusion, glucose or calcium chloride intravenously, the abdomen is opened under local anesthesia. Adhesions are carefully separated, and a gauze pack surrounded by a rubber dam is placed so as to isolate the infected parts. Further procedure is limited to opening the bladder and removing stones when easily possible. Under such treatment we have a right to hope that the patient will survive, always regretting, of course, that another operation will be necessary. However unfortunate this may be, it is better to be safe than sorry.

Perforated peptic ulcer, if seen early, can be recognized by three outstanding and distinct symptoms: (1) excruciating pain; (2) extreme rigidity; (3) disinclination to move or be moved.

In the words of Lord Moynihan, "the patient is struck motionless." He adds, "that when the pulse is examined a great surprise is felt, for it is not increased in frequency nor diminished in volume, the blood pressure is not diminished, and in a few cases that we have examined, the blood volume is unchanged. There is therefore no 'shock.' Great harm has come from the almost invariable use of the word 'shock' to describe the conditions." While Lord Moynihan is correct as regards actual findings, the fact remains that the patient in his extreme agony presents every outward symptom of shock. The picture is not unlike that resulting from a high explosive.

Perforated ulcer demands immediate operation. When possible the operation should be done under local or spinal anesthesia. When the abdomen has been opened, the question arises what next and how much? Here again experience has taught us that the less that is done the better for the patient. Under certain conditions, such as complete obstruction of the pyloric ring, one is justified in closing the ulcer and immediately performing a gastroenterostomy. Since the operation is essentially a life saving one, we feel that, unless more radical procedure is definitely indicated, one should content himself with closure of the rupture, leaving further work, if that should be necessary, to a more favorable time.

For many years we have used a modified Balfour technic in closing the perforation. This consists in burning out the ulcer with the electric cautery, bringing the edges together with through-and-through sutures of forty-day catgut, covering over with a row of Lembert suture, and again plastering this over with a layer of omentum.

Following this procedure we have had only one patient who required a subsequent gastroenterostomy. Another had a second perforation at the same site three months after the first rupture. This case was interesting because the patient, a young lady, at the second attack immediately recognized her condition, ordered a cab and was on the operating table within an hour from the time the perforation took place. After closing the lesion in this case, a gastroenterostomy was immediately done. She has gained twenty pounds, and remained well ever since. In about ninety per cent of our cases, the perforation was in the anterior wall of the duodenum.

In intestinal obstruction, unless the condition is recognized early, we believe that operation should usually be limited to an enterostomy above the obstruction, thus draining the toxic intestinal contents and giving the patient time to recuperate before removal of the obstruction is attempted. At the recent State Meeting, Dr. Counseller stated that the bowel contents both above and below the obstruction are almost equally toxic. Accordingly, it may be advisable to drain both proximal and distal to the obstruction.

Of all the conditions in the category of acute abdominal crises, ruptured ectopic gestation is perhaps the easiest to diagnose. About the only reasonable excuse one can offer for failing to recognize a typical case is that "I never thought of it"; an indictment to which we are often obliged to plead guilty. We are not yet convinced that leaving the blood (auto-transfusion) in the abdomen is of benefit to the patient. The only case of ruptured extra-uterine pregnancy that we have lost was one in which a large amount of blood was allowed to remain. The patient died on the fourth day from no apparent cause. Whether the blood in the abdomen was a contributory cause of her death or not, we don't know.

In operating for intussusception, one should never neglect to provide against recurrence. Our experience has taught us that the best precaution is to bring the terminal ileum up alongside the ascending colon for about three inches, tacking it there with two or three sutures. I do not recall the name of this procedure, nor that of its originator. It was suggested to me by Dr. Birnberg while operating upon one of his patients.

Acute gonorrheal peritonitis is sometimes difficult to differentiate from acute appendicitis. The history is apt to be misleading. A positive smear may not be obtainable, and because of the apparent innocence of the victim, the possibility of Neisserian infection is often overlooked. Pain and tenderness is frequently most marked just below McBurney's point.

It is an accepted fact that acute gonorrheal peritonitis, if unmolested, will pass through a cycle lasting from two to six weeks, leaving, perhaps, a few adhesions or possibly a chronic pyosalpinx, but otherwise ending in complete recovery. If, however, a laparotomy is done during this acute stage, and the abdomen is closed without adequate drainage, there usually develops a violent general peritonitis which only too often ends in death of the patient. To the inexperienced this may seem a radical statement, but the fact remains that the mixed infection brought about by opening the abdomen at this time is almost sure to prove disastrous. Coffey, recognizing this danger, devised a drain consisting of twenty or thirty gauze wicks laid across the abdomen reaching down into the pelvis. The intestines are shut off by five or six layers of gutta-percha tissue. In 1920 the writer presented a paper before the Sioux Valley Medical Society in which was described a vaginal drain that in our hands has been eminently successful in these cases. It consists of a large split rubber tube with two strips of iodoform gauze which is passed from the culdesac through an opening in the posterior vaginal wall. What is meant therefore by adequate drain is not the ordinary tube and cigarette, but one that provides for escape of the infected discharge by gravity, or one that completely isolates the offending parts, at the same time acting as a cofferdam to shut off the intestines. It might be stated that we believe the vaginal drain mentioned, in addition to its use in acute gonorrheal peritonitis, has been a life saver in many cases of peritonitis from appendicitis and other causes. Some years ago I was severely rebuked by a colleague for placing a vaginal drain in a supposed virgin. I replied that if she were a member of my own family I would infinitely rather have her alive with a ruptured hymen than see her in her grave with that vestige intact.

In conclusion let me add that when confronted with an acute abdominal emergency, we must bear in mind that the majority of these cases do not present a primarily acute condition, but the acute termination of a chronic disease.

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ABSCESS OF THE LIVER*

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> "For the King of Babylon stood at the parting of the ways, at the head of the two ways to use divination; he made his arrows bright, he consulted with images, he looked in the liver."—Ezekiel, XXI-21.

THE liver has, for ages, been the subject of curiosity. Three thousand years ago the Babylonians constructed clay models of this organ and these are regarded as excellent specimens of anatomic illustration today. In "looking into the liver" the Babylonians were in quest of soothsayer's guidance, whereas, thirty centuries later, we look into the liver in quest of scientific facts.

The present undertaking has for its purposes: (1) to consider a group of fifty hitherto unreported post-mortem liver abscess cases, for critical study; (2) to review some of the customary statements and descriptions of the liver abscess syndrome in the interests of verification or of change; (3) to find, if possible, some aids by which we may conquer this somewhat unusual but very baffling and highly fatal disease which involves the largest of the important organs of the body.

Fortunately the septic liver abscess, as distinguished from the abscess of amebic origin, is not of common occurrence. On consulting the records of some 18,300 autopsies, I found 111 cases of liver abscess, this condition accounting for .06 per cent of deaths from all causes. It is moreover somewhat uncommon in the experience of the average surgeon. In this group of cases it occurred three times in one surgeon's experience, twice in the experience of six and but once in the experience of all the others. One writer on this subject, using fourteen cases for his discussion, mentions ten cases of his own. Another writer believed liver abscess to be rare because in his extensive experience he had seen but three cases.

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When we stop to consider that the portal system of veins passing into the liver drains the stomach, all the small intestine, the appendix, the cecum, ascending, transverse and most of the descending colon, as well as the spleen and the pancreas and also the cystic vein of the gallbladder, it seems strange indeed that the liver, even though so admirably contrived to strain out or to filter the impurities from the venous blood which comes from so extensive an area, should not more often be overwhelmed in the performance of its duty as scavenger for the intestinal tract. Beaver suggests that protection against infection is to some extent dependent on its abundant blood supply with free movement of blood through the sinusoidal vascular system.

The males predominate in this series over the females thirty-nine to eleven. The youngest patient was a newborn female and the oldest a woman of eighty-two years. An abscess of the liver holds its threat chiefly for persons in adult life, only seven cases occurring under the age of twenty. In going over the various histories it appears that thirty-two of the fifty patients (64 per cent) were chronic sufferers from a variety of complaints over periods ranging from four weeks to seven years. Only twenty-six per cent were such as to fall into a strictly acute or subacute catagory. The onset in 44 per cent was indeed acute, but some of these were instances in which acute onset was superimposed upon a chronic background.

SYMPTOMS

There was upper abdominal pain in twenty-five of thirty-four patients (73 per cent) giving information on this point; in twelve of twenty-five (approximately 50 per cent), chiefly epigastric. Eight patients had general abdominal pain and in six of these general peritonitis was found at autopsy. There were no instances of pain referred elsewhere. Chief reliance therefore should be placed on pain in the epigastrium or in the liver area.

The presence of chills was a prominent symptom in twenty-three of the fifty cases (46 per cent). In sixteen of the cases chill was not mentioned, but in eleven cases chill was denied.

Sweating was mentioned in twelve cases; headache in six; vomiting in twenty-one; anorexia in sixteen; loss of weight in twenty-three and fever, ranging from 100 to 106, in thirty-four cases. Jaundice was present in twenty-two cases, not present in twelve and not stated in sixteen.

There was upper abdominal tenderness in fourteen of twenty-two patients (63 per cent) giving this information. Here again the epigastric region was the chief site, the right epigastrium or liver area more particularly. There were five instances of general abdominal tenderness; four of these were shown to have peritonitis at autopsy.

Leukocytosis was, in the majority of instances, under 20,000. Eighteen of thirty-one recorded cases (58 per cent) showed white counts between 10,000 and 20,000. A case of polycystic liver with abscess formation showed a white count of 9,500 and a carcinoma of the pancreas case showed a white count of 9,000. Eleven of the cases had white counts ranging between 20,000 and 40,000.

There was a tendency for the hemoglobin to fall as the disease progressed. The lowest was 45 per cent. A corresponding lowering of the red cell count was usually present.

AUTOPSY FINDINGS

In thirty-one of the cases (62 per cent) abscesses were present in *both* lobes of the liver. In nineteen cases (38 per cent) abscesses were found in the right lobe only. There was no instance of a solitary abscess in the left lobe. Most of the cases of right lobe involvement were of the multiple abscess type. Only five cases of single abscess of the right lobe were found, however.

The associated pathologic lesions found postmortem furnish an interesting background for discussion. An approximately complete list of anatomic diagnoses is given below:

Anatomic Diagnosis	No. Cases
Peritonitis	14
Gallstones	11

Chronic Cholecystitis	7
Septic Portal Thrombosis	6
Perforated Duodenal Ulcer	4
Perforated Gastric Ulcer	3
Appendicitis (ruptured)	3
Appendicitis (not ruptured)	3
Appendicitis (gangrenous)	3
Suppuration Mesenteric Veins	3
Carcinoma of Stomach	3
Carcinoma of Pancreas	3
Cholangitis	2
Acute Cholecystitis	2
Empyema of Gall Bladder	1
Gangrene of Duodenum	1
Suppurative Gangrenous Pancreatitis	1
Perforative Ulcer of Colon	1
Carcinoma Ampulla of Vater	1
Chronic Appendicitis	2
Cholecystoduodenal Fistula	1
Septic Pericolitis	1
Subphrenic Abscess	1
Abscess of Spleen	1
Abscess of Kidney	
Abscess of Adrenal	
Polycystic Liver	
Polycystic Kidneys	
Actinomycosis Liver, Adrenal Nodes	
Septic Diverticulitis, Sigmoid	
PELVIC	
Salpingitis	1
Abscess of Ovary	1
Septic Abortion	1

A list of lesions of the liver and its appendages taken from the preceding enumeration follows·

Anatomic Diagnosis	No. Cases
Gallstones	11
Chronic Cholecystitis	7
Cholangitis	2
Acute Cholecystitis	2
Empyema of Gallbladder	1
Cholecystoduodenal Fistula	1
Polycystic Liver	1
Total	25

A similar list of lesions involving the appendix is made as follows:

Anatomic Diagnosis	No. Cases
Appendicitis, gangrenous	3
Appendicitis, ruptured	3
Appendicitis, not ruptured	3
Appendicitis, chronic	2
Total	11

In a comparison of the last two tabulations it will be seen that lesions of the liver and its appendages are associated with liver abscess more than twice as frequently as are lesions of the appendix. The argument might be advanced that acute appendicitis occurred in the presence of gallbladder or liver disease and that the appendicitis was the immediate causative factor in the liver abscess. A search of the records, however, shows there was no finding of the two conditions occurring in the same individual in this series of cases.

A list of gastric and duodenal lesions follows:

Anatomic Diagnosis	No. Cases
Perforated Duodenal Ulcer	4
Perforated Gastric Ulcer	3
Carcinoma of Stomach	3
Cholecystoduodenal Fistula	1
Gangrene of Duodenum	1
Total	12

It will be seen likewise from the above list that lesions of the stomach and duodenum, not including pancreatic lesions, outnumber lesions of the appendix. Moreover, if we compare the total upper abdominal lesions with the total lower abdominal lesions the lower are outnumbered almost three to one.

Lung abscess occurred ten times in this series. Clinically, a lung abscess may be found as a complication of an occasional silent chronic abscess of the liver. A few cases of the latter have been reported. Collapse of the lung, septic infarcts, pleural empyema, pleural effusion, pericarditis and acute bacterial endocarditis each occurred in one case.

There were three cases with abscess of the brain, three cases classed as subcutaneous abscess and pyoderma and one instance each of umbilical cord infection in a newborn; of otitis media in an infant of fourteen months; of acute osteomyelitis in a boy of twelve and of abscess of the leg in a man of sixty-three. One of the cases of subcutaneous abscess occurred in a boy 17.5 months. The remote lesions in this series therefore have occurred for the most part in infants and children. But one case of acute appendicitis in childhood in this series is recorded, namely in a boy of twelve.

DIAGNOSIS

Such recognizable symptoms of liver abscess as can be established are usually preceded by some acute or chronic illness of intra-abdominal origin. Some of the exceptions to this rule will be discussed later. A woman of fifty-nine, reported by Parenti, who had had sharp hepatic colicky attacks for three years, finally developed symptoms of liver abscess and died. At autopsy the liver showed not only multiple abscesses but in addition many calculi embedded in the liver substance. The calculi were observed to be near but not within the pus cavities. The gallbladder was also filled with calculi. In the case reported by Webb, a schoolboy of fifteen was operated upon for acute appendicitis with accompanying peritonitis. Chill and high fever occurred on the twelfth day. On the twenty-first day an abscess in the liver was found at operation. The abscess cavity was packed and drained, with resultant recovery.

In discussing abscess of the liver, Lindquist speaks of a symptomatic triad of: (1) Irregular septic fever; (2) pain, either spontaneous or on pressure over the liver area; (3) enlargement in liver volume. In addition there are less constant symptoms which will be discussed in turn.

Fever.—The irregular septic fever in abscess of the liver is a symptom recognized by most observers. It was present in 68 per cent of the cases here reported. The symptom, however, was not mentioned in fourteen cases and it is reasonable to suppose that a considerable proportion of these ran a fever and that at least 75 per cent of such patients will show a septic fever. There is an occasional exception as in one isolated instance in this group. Here the temperature was 99 and the chart showed a curve for the most part subnormal, yet the leukocyte count ranged from 12,000 to 19,000 and at autopsy there were found not only multiple liver abscesses but also peritonitis. On the other hand, in nineteen of thirty-four cases (52 per cent) the temperature ran 103 or higher and in twenty-five cases (73 per cent) the temperature ran 102 or higher. Holden makes the differential point that in septic liver abscess the temperature tends to run high with irregularities, whereas in subphrenic abscess the temperature tends to be continuous even though moderately high. Septic fever was present in all of the four cases reported by Lindquist.

Pain.—This is not always spontaneous and must, at times, be elicited by manipulation. Schwartz and also Beaver report each a series of cases in which the onset was slow and insidious. Pain was found by Schwartz to be an outstanding symptom. In one silent case, liver abscess was not suspected at all clinically but was discovered at autopsy. In four cases following acute gangrenous appendicitis reported by Lindquist there was no pain in three and only slight pain on pressure in the fourth. In the current series of 50 cases pain was a prominent symptom in 70 per cent. Schwartz makes the observation that pain was worse in the cases where a perihepatitis existed. Dixon and Murphy call attention to a referred pain in the right shoulder area, which, when present, should suggest an investigation as to the presence of liver enlargement.

Liver Enlargement.—Percussion and palpation may give indifferent information. Peterson calls attention to variations in the position and size of the liver. In children it is comparatively larger; in adults it may vary according to posture; in meteorism the liver outline may be obliterated in varying degrees. However, several observers stress the point that demonstrable liver enlargement is an important sign. Fluoroscopic examination is an important aid. Granger makes the point that elevation of the diaphragm with obliteration of the cardio-phrenic angle in an antero-posterior view and of the anterior costophrenic angle in the lateral view means a subdiaphragmatic abscess secondary to a liver abscess. Boland, in discussing this phase of diagnosis, feels that roentgen examination cannot always be helpful. The demonstration of an elevated diaphragm is useful information but sometimes it seems difficult to determine whether the pathology is below or above the diaphragm. He quotes Le Wald, who demands that a lateral thoracic roentgenogram should always be taken. The latter brings out the complete curve of the diaphragm and seldom fails to differentiate between disease above or that below. Schwartz emphasizes roentgen elevation of the diaphragm and limitation of excursion. The restriction of excursion, however, is greater in subphrenic than in liver abscess owing to the inflammatory reaction adjacent to the chest wall.

A recognition of some of the less frequent symptoms occurring in cases of liver abscess will help to build up the clinical picture. Chills occur daily in some of the cases. Daily or frequent chills are mentioned in six of the fifty cases in this report. Schwartz found that chills or chilliness were common symptoms. Webb's boy of fifteen had a chill on the twelfth day following appendectomy. Holden's patient, a farmer, had daily chills and fever of 102 to 105. Eliason quotes Gerster to the effect that chills usually signify the entrance of septic material into the portal and general circulation, and that the chill is an important sign when it comes. He further states that a chill immediately after appendectomy suggests a rapid spread of infection into the portal system with pylephlebitis and liver involvement. If, however, there is a gradual drop in temperature post-operatively and a later rise, five to eight days later, with chilliness, the suspicion is aroused of a septic embolus in the liver and a single abscess. If chills and fever persist after evacuation of such an abscess one suspects multiple abscesses.

Sweating.—This is recorded in twelve of the fifty cases. In my own patient the sweating was very profuse and debilitating. In the eight cases of Schwartz, sweating was a constant symptom. Dixon and Murphy quote Keefe, who gives this symptom a prominent place in the clinical picture. I found no definite statement in current literature on the precise occurrence of sweating and am of the opinion that it is more prevalent in these cases than would appear from the records.

Jaundice.—When present, jaundice is at once a significant sign. It was recorded in approximately 60 per cent of these cases. Heimark and Coventry's patient, a man of fifty-five, had epigastric pain followed by diarrhea and later by jaundice. There were no other focal symptoms. At autopsy were found multiple abscesses of the liver, pylephlebitis, peritonitis, aortic stenosis, embolism of the pulmonary artery, infarct of the left lung and an edematous gallbladder. Eliason, in fourteen cases, found that jaundice was almost invariably present and early, though it was sometimes faint. Lepehne does not consider jaundice necessary in the clinical picture. In Parenti's case, with multiple calculi in the liver substance, the jaundice appeared late. It appeared late in my patient also. Jaundice, therefore, if manifest early, is a helpful sign but a sign which should not be waited for in constructing a clinical diagnosis.

Tenderness.—This was present in all of Eliason's cases. Upper abdominal in location generally and toward the liver area most often, it thus tends to focus the attention on the involved part. It was present in 63 per cent of the fifty cases. Eliason used the fist-percussion of Murphy to elicit the tenderness in some of his cases. Parenti speaks of tenderness in his patient at the eleventh rib and Ludlow, from his observations on 100 cases of amebic abscess among the Chinese, found an almost constant sign of tenderness in the sudden thrust of the thumb or end of the finger at the ninth interspace about two inches from the costal border.

Puncture.—In the search for confirmatory evidence in cases of suspected liver abscess the procedure of puncture has been the subject of considerable discussion. Schwartz feels that diagnostic exploratory puncture is dangerous and that it should be used only in the operating room when one is prepared to operate at once, a position taken likewise by Dixon, who further believes that aspiration should be restricted to cases of amebic abscess. Wilmuth recently described a method of needle exploration using a blunt pointed spinal puncture needle through which, when pus is found, iodized oil is injected into the cavity for roentgen examination and location of the size and position of the cavity. Heineman, who feels that there is no other method of differential diagnosis, has performed one hundred tappings without complications, though there is no comment as to the relative value of his findings. On the whole, when one considers the postmortem appearance of the liver in an abscessed state, with multiple cavities, some deep, others toward the surface, some large and some small, there arises considerable doubt as to the essential value of puncture, unless done at operation. Should a single abscess be present, a condition of right lobe involvement, and one which offers the best surgical prognosis, it should be discovered early, while it is still relatively small. Exploration with the needle, therefore, presents a surgical problem at the time of exploratory laparotomy when the liver may be under direct vision. Definite signs of localization may be seen at once on inspection of the liver or may be discovered by palpation. Random punctures by any other method would seem to be attended by a high percentage of failures in finding the abscess and with large possibilities of damage to healthy areas of the liver.

Holden presents a helpful tabulation of symptoms and signs with a view to differential diagnosis between abscess of the liver and subphrenic abscess as follows:

LIVER ABSCESS

1. Complicates disease or operation on gallbladder, stomach or intestine.
2. Severe chills irregularly, sweating and high irregular fever.

3. Very little or no tenderness.
4. Prognosis quite hopeful.

SUB-PHRENIC ABSCESS

1. Same.
2. No chills or sweats. Temperature continuous. Much pain.
3. Considerable tenderness.
4. Prognosis fairly good if abscess drained.

PATHOGENESIS

Liver infection of abdominal origin is most often the result of infected emboli carried from a primary focus of inflammation. Acute appendicitis is a frequent forerunner of liver abscess, a fact recognized and described by other writers on this subject. It has been shown, however, by analysis of the fifty cases in this report that infections of the biliary tract are even more often associated with liver abscess than with appendicitis. Osler suggested, thirty years ago, that disease of the bile passages was not uncommonly associated with liver abscess. Among other causes he cited parasites and foreign bodies such as a swallowed needle passing from stomach or gullet and finding lodgment in the liver with consequent infection and abscess formation. He cites also the penetration of a fish bone into the liver with resultant abscess. He mentioned echinococcus cysts with infection and, most rarely of all, liver-fluke as additional causes.

Donald Beaver (1931) from a critical study of eight cases observed that abscesses of portal origin are at first multilocular due to multiple emboli. Each multilocular abscess usually remains discrete although they may be multiple. General hepatic dissemination in this type is unusual and involvement of the right lobe is most common.

The direct cause leading to liver abscess formation is not always so easy to trace, however. In the eight cases discussed by Schwartz, the onset was slow and insidious and the only common factor was the occurrence of grippe in every case. Dixon and Murphy report a case in detail in which the cause was not apparent clinically nor did autopsy reveal it. Cabot cites a man of eighty-two with a clinical diagnosis of acute hepatitis and cholecystitis who showed multiple abscesses of the liver at autopsy.

In certain cases, according to Beaver, either due to diminished or specific virulence of the microörganism or to a specific resistance of the host, pyogenic micrococci may involve the liver in abscess formation which may persist into a chronic granulomatous stage. He describes several cases of this type and observes that extreme chronicity may occur with preservation of the original multilocular arrangement, or a solitary adequately encapsulated abscess may result.

TREATMENT

Treatment is surgical, with a diagnosis made at as early a stage of the disease as possible.

Here and there, in the literature, one finds an occasional hint of a recovery without surgical interference. One should mention, at this point, Holden's experience in one case in which at operation pus was aspirated from a liver abscess and in which the after-care consisted in intravenous mercurochrome. This patient recovered. He therefore used the same procedure in a second case but the patient died. Autopsy showed multiple abscesses of the liver. As to whether his first case was one of single abscess of the right lobe in which drainage was the prime factor in the cure or whether the mercurochrome played an important part in the prevention of diffusion of infected emboli we have no clue.

Schwartz (in 1930), and more recently Dixon (in 1932), are insistent upon a definite surgical approach through the abdominal route. They discourage exploratory puncture except at operation, when adequate drainage should then be established.

Webb, after locating the abscess at operation, used the exploring finger in the abscess cavity to connect small adjacent loculations with the main cavity.

Ludlow follows this procedure in amebic cases also. Webb not only drained the cavity but also packed it. While the single abscess furnishes the best prognosis, even this requires early operation.

In the case of an infant of seventeen and one-half months, the liver abscess was opened and drained but healing was delayed and the patient finally died. At autopsy there were signs of liver regeneration. Including this infant there were five cases in this series of single abscess of the right lobe:

1. A man of forty-five showing pneumonia and lung abscess at autopsy.
2. A woman of sixty-six, showing, at autopsy, bronchial pneumonia, cholecystitis, gallstones in

a liver abscess cavity, and a fistula between the gallbladder and the duodenum.

3. A woman of sixty-five, ill four years with repeated gallstone attacks, showing, at autopsy, a large single abscess and gallstones.

4. A man of forty-nine with perforated gastric ulcer and abscess of the right lung and bronchial pneumonia.

One sees, therefore, that operation in the later stages, even in single abscess of the right lobe, will be followed by a large mortality due mainly to complications of a major sort. Early diagnosis and operation, therefore, should be earnestly attempted.

The operative mortality is stated by Lockwood to be between 20 per cent and 50 per cent in subphrenic cases. At autopsy the observation is frequently made that sufficient drainage has not been established. This is most important. The liver is destined to be destroyed by multiple abscesses unless these are all drained. Therefore, an heroic breaking down of obstructing walls between cavities, using blunt dissection, seems justified. The early stage described by Gerster wherein the chill occurs shortly after an appendectomy or other operation may be the only time during which intravenous mercurochrome is of value, granting that this may reach a septic thrombus about the time a shower of emboli may be strewn into the liver. This procedure may be of value and need not delay early exploratory operation should signs of liver abscess appear.

The mortality has been high but the prognosis is not entirely hopeless. Even in amebic abscess cases, where the single abscess in the right lobe is the rule, the mortality is placed at about 35.7 per cent. More favorable reports are being recorded. Von Heberer had one recovery in six operated cases. Seven of Eliason's fourteen cases recovered. When he averaged his cases with others he arrived at a figure of 54.5 per cent mortality.

Webb, with the inclusion of his own reported case, found thirteen cases with six recoveries recorded since Eliason's report. A mortality of 54 per cent, therefore, should not discourage surgical interference, since without surgical interference the prognosis is most grave.

SUMMARY

Liver abscess constitutes .06 per cent of deaths from all causes. It occurs more than three times as often in males as in females, and most frequently in the fifth decade.

No specific symptom-group seems pathognomonic of liver abscess. In this brief review of fifty cases of septic liver abscess, pain, which occurred in 70 per cent, was sometimes completely absent. The high, irregular septic fever present in 68 per cent of the cases furnished a hint of possible septic portal involvement.

If, however, together with pain and high fever, the additional symptoms of chills and jaundice are demonstrable, and with liver tenderness obtainable either by means of Ludlow's thumb thrust or Murphy's fist percussion, coupled with signs of liver enlargement, one should feel justified in advising surgical exploration. One should feel fortified further in his diagnosis of liver abscess, should the history reveal a previous abdominal infection. Appendictis is not an infrequent precursor, but cholelithiasis, cholecystitis, cholangitis and inflammatory lesions surrounding the liver area are considerably more frequent, amounting in this series to 50 per cent.

Upper abdominal infections, as forerunners of liver abscess, outnumber lower ones three to one. Occasionally the probable cause is indefinable.

Exploratory puncture is useful when the liver is exposed at the operating table. Blind punctures are discouraged. A single abscess in the right lobe furnishes the best surgical prognosis. The earlier one discovers the abscess the better for the life of the patient and for the success of the surgeon. Even in this single-lobe, single-abscess type the mortality is considerable.

Adequate drainage at operation is important. Autopsies have, in many cass, shown inadequacy of drainage. This finding, therefore, suggests the possibility of more often establishing communication between the smaller pus cavities and the larger cavity which is being drained.

DIVERTICULA OF THE GASTRO-INTESTINAL TRACT*

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ESOPHAGUS

Classification.—Diverticula of the esophagus are divided into three types: (1) traction; (2) pulsion, and (3) occasional traction-pulsion diverticula.

Traction diverticula are due to a pulling force acting from outside the esophagus. The common etiologic factors are: cicatrix formation in a healing suppurative gland, mediastinitis, adhesions to the thyroid, diseases of the lungs and pleura, and diseases of the spine. These diverticula characteristically point upward and outward to a greater or lesser extent from their bases to their apices. Thus, they rarely retain food or mucus and are almost invariably symptom-free. For this reason they are of academic interest only.

Occasionally the apex of the sac is low enough to allow an accumulation of food particles. These cases are known as traction-pulsion diverticula and they sometimes become quite large. However, even then they seldom are of clinical importance and are usually accidentally discovered on roentgen or post-mortem examination. Their location may be in any portion of the esophagus, usually, however, below the upper third.

Pulsion diverticula are known as Zenker's diverticula. They occur in the cervical region and arise from the unsupported esophageal wall directly opposite the cricoid cartilage. The location is due to a combination of two factors: (1) a divergence of muscular fibres at this point, leaving a small triangular area uncovered by muscle where the mucosa and sub-mucosa can be forced out by presure; and (2) the failure of the cricopharyngeal muscle to relax in the act of deglutition, causing herniation of the pharyngeal wall above the cricoid.

Diagnosis.—The history, symptoms, and physical findings of this type of diverticula are quite characteristic. Difficulty in swallowing, choking sensations, nausea, raising of much mucus from the throat, and regurgitation of food are the common symptoms. A visible or palpable tumor in the neck is noted in about one-third of the cases. This tumor is usually on the left side. Pressure on the recurrent laryngeal nerve may cause hoarseness. Coughing often causes a bulging of the sac and occasionally the sac may rupture into a bronchus. Weight loss is almost a constant finding. The diagnosis is made by means of the X-ray. Fluoroscopically after barium administration, the sac can be seen distinctly, usually in both lateral and antero-posterior positions.

Treatment.—The treatment of the condition is surgical and it should be as conservative as possible. Occasionally, when the diverticulum is small and when its opening is large, dilatation with large sounds will relieve the symptoms. Surgical procedures usually employed are those described by Murphy (two stage), Sippy-Bevan (infolding of the sac with a series of purse string sutures), C. H. Mayo (two stage) and Chevalier Jackson with an esophagoscope for guidance). The latter procedure has been highly successful in skilled hands.

DUODENUM

Incidence.—The incidence varies according to various observers from 0.5 to 5.0 per cent. In 1920, Case found eighty-five cases in 6,847 gastro-intestinal studies or an incidence of 1.2 per cent. In 11,470 patients examined by X-ray the diagnosed incidence of diverticulosis was 2.5 per cent. This is an average taken from the figures stated by five X-ray observers.

Classification.—Duodenal diverticula have been classified heretofore as true or false; or congenital or acquired, according to their supposed origin. Odgers suggests the following classification:

1. Primary—where there is no obvious cause for their appearance. This corresponds roughly to the false or congenital group. These occur beyond the first portion.
2. Secondary—where there is some cause for their production, such as old or recent duodenal ulcer or traction of adhesions from neighboring structures. This is the true or acquired group and occurs usually in the first portion.
3. Those due to dilatation of the papilla of Vater or of the bowel wall about it.

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Etiology and Pathology.—The secondary group will not be considered here because their pathology is essentially that of the etiological factor. The third variety will also be ignored in this discussion because those due to dilatation of the papilla of Vater are usually associated with liver and bile passage diseases, pancreatitis, or are occasionally of congenital origin. Those diverticula due to out-pouching of the bowel wall about the base of the papilla of Vater cannot be of clinical importance. Only the primary group will be discussed.

Etiologically these diverticula have been explained from various angles. The older observers regarded them as acquired pouches of either pulsion or traction types. More recently they have come to be regarded by the majority of writers as being of congenital origin. There are many reasons to support this latter view though there is no definite proof. However, it is true that they are always found at actual or potential weak spots in the bowel wall.

These diverticula vary greatly in size and shape. They range from a few millimeters in diameter and depth to narrow pockets six centimeters or more in length, on the average being one to two centimeters in depth. Most have an expanded fundus narrowing to a neck of variable size which opens into the bowel. Characteristically they are composed of mucosa and submucosa which is thin and atrophied and the muscle coat is absent. These primary diverticula are often multiple and are usually within the duodenal loop and in relation to the pancreas; either in front of, behind, or imbedded in the head of the pancreas. Post-mortem studies lead one to believe that the condition is one of old age. However, radiologists are finding them in early adult life occasionally. We may assume that the anlage of the diverticulum is present in young people, but it is only in those of advanced years that the pouches become large enough to be sources of symptoms or objects of interest after death. Spriggs and Marxer have noticed such growth in diverticula.

They are usually found as empty sacs lying in a bed of areolar tissue in relation to the head of the pancreas. The great majority are innocuous because of: (1) their retroperitoneal position allowing great distention; (2) the dependent position of their opening into the bowel; and (3) the relative sterility of the duodenal contents. Those, however, which do not empty readily may cause distortion or obstruction of the duodenum or bile passages by distention. Other complications may be: diverticulitis with perforation, peridiverticulitis, ulceration with hemorrhage, and carcinoma, all of which have been discovered. Also, cholangitis, gallstones, and acute and chronic pancreatitis have been found associated with diverticulosis in which the diverticula were probably responsible.

Signs and Symptoms.—We believe that by far the larger proportion of diverticula are symptomless and their discovery is almost invariably accidental. It seems reasonable to suppose that in the absence of complications there can be no symptoms caused by such diverticula. There is no evidence, physiological, pathological, radiological, or mechanical to explain the symptoms. However, it is probable that those which retain the barium, which in our experience constitutes a very small percentage of cases, are the ones that cause symptoms.

There are no certain symptoms and signs which are diagnostic of these pouches. Vague digestive disturbances are sometimes noted. These are: a feeling of heaviness and distention after food, perhaps nausea, but no actual vomiting. Sometimes there is diarrhea. A history suggestive of peptic ulcer may be obtained which on careful analysis will be found wanting in one or more diagnostic features.

Diagnosis.—No case has ever been diagnosed on clinical evidence. The only method of diagnosis is by X-ray examination after an opaque meal. The technic is simply that of a routine barium meal consisting of fluoroscopic and serial film examination. No particular attention need be given to the type of opaque medium used. The fluoroscopic examination should be carried out in the erect, horizontal and oblique positions. Serial radiography is of value because it shows the diverticula in filling and emptying phases. Duodenal diverticula must be differentiated from: Ulcer craters, redundancies (congenital or acquired), barium retained in the colon from a previous examination, biliary or renal calculi, and calcified glands.

Prognosis.—It must be remembered that the symptoms described and the few serious complications mentioned in the preceding paragraphs are collected from various sources in literature and that they represent an extremely small proportion of known cases. Also it must be remembered that the great majority of cases discovered roentgenologically or by post-mortem give no history indicating that they ever cause trouble during life. In our experience, only one diverticula could be regarded as the cause of symptoms. In this case there was ulceration in the diverticulum with resultant hemorrhage. Haudek, in 1924, studied carefully the results of operations for duodenal diverticula and made the statement that in no case has the removal of the pouch cured the abdominal symptoms for which the operation was performed. Occasionally, duodenal diverticula may give rise to symptoms, and exceptionally, they may be of serious import.

Treatment.—No patients with duodenal diverticula should be regarded as having symptoms referable to the diverticula unless all other lesions of the abdomen have been definitely ruled out. In such patients a medical regime should be carried out. Such management will relieve symptoms in a short period of time. Spriggs suggests that the optimum position for emptying of the diverticula be determined by X-ray observation of its mouth, and that the patient assume this position for half an hour about three hours after meals. Also, he recommends that liquid petrolatum be given in small doses night and morning for lubrication of the pouch. Lastly, attention is paid to the digestion and an attempt is made to tone up the entire alimentary canal.

Surgical treatment is never justified in uncomplicated cases because the risk of future complications is so small that it can be disregarded. If a complication should arise, surgery must be resorted to as in any other acute abdominal condition and the treatment followed will depend on the surgeon's skill and judgment.

Jejunum and Ileum.—Primary diverticula of the jejunum and ileum also occur but even less than in the duodenum are they of significance. Their diagnosis in the living is made only by X-ray after an opaque meal and they are of interest only as pathological rarities.

COLON

Incidence.—From post-mortem studies all observers give the occurrence of colonic diverticula to be well under 1 per cent. X-ray studies show a much higher percentage. This cannot be taken as the incidence for the entire population as those examined by X-ray usually have some symptoms, definite or indefinite, pointing to disease of the gastro-intestinal tract. The incidence according to age is greater, by far, in patients above forty-five and, according to sex, males and females are affected about equally.

Classification.—We classify colonic diverticula into three groups:

1. Diverticulosis; in which diverticula are diagnosed by X-ray but in which there is no evidence that they are of significance to the patient, subjectively or objectively.
2. Diverticulitis—uncomplicated; in which there is evidence of diverticula associated with signs of inflammation and infection.
3. Diverticulitis—complicated; in which diverticulitis is present with signs of perforation, abscess formation, fistulæ or obstruction.

There are also a fairly definite group of findings noted on colon examinations which seem to appear as forerunners of diverticulosis. This is known as the pre-diverticular stage, and is characterized by a serrated or saw-tooth appearance of the colon associated, usually, with spasm. Diverticulosis and diverticulitis have repeatedly been observed to occur in colons which originally had this appearance.

Etiology and Pathology.—The process of development of diverticula and their cause is not definitely known. In the true sense of the term they are not congenital because they are not noted in infancy and childhood. However, they arise at potential or inherently weak spots in the bowel and the immediate cause of their formation is based upon increased intra-colonic pressure due to constipation with a resultant cycle of inflammation with lowered local resistance. It is an unsettled question whether or not diverticula of microscopic size are present at the time the pre-diverticular stage is noted. It appears that the question is one of academic interest only, for, certainly, at this period the signs which we interpret as being due to irritation are present.

Once formed, the diverticulum assumes a bottle-shape with wide body and narrow neck. It is usually formed of mucosa which has herniated through the muscularis. It may be single but there are usually multiple diverticula in an affected colon. Diverticulosis may be found throughout the entire colon, including the appendix, but the descending and sigmoid portions are usually the most markedly involved areas.

The majority of patients with a diverticulosis, however, do not develop a true diverticulitis. Furthermore, only a small percentage of patients with diverticulitis develop complications. Most often the changes which cause symptoms and require treatment arise in the lower descending and sigmoid portions, due no doubt, to stasis which normally occurs in these portions and to the character of the fecal content which in these portions is formed rather than liquid or semi-solid as in other regions.

The inflammatory changes leading to diverticulitis and its complications begin in the diverticular sac with consequent round-cell infiltration in the bowel wall and ulceration. This process extends into the mesentery with thickening and often tumefaction. Abscess formation may result as a result of a perforation, with symptoms simulating appendicitis, on the left side. Peritonitis after perforation is usually walled off because the development of the process is slow. Obstruction, which occasionally occurs, is due to extrinsic reaction and contraction of the bowel wall due to long standing inflammatory changes. Fistula formation sometimes occurs and is the result of perforation.

Carcinoma apparently is not a result of diverticulosis. Occasionally, the two are associated. but not frequently enough to lead one to believe that diverticulosis predisposes to carcinoma.

Symptoms and Signs.—In the pre-diverticular stage, symptoms are slight if present at all. Constipation is usual and there may be tenderness on palpation over the involved area.

It must be remembered that a very extensive diverticulosis may be present with no discomfort to the patient and that its discovery is entirely accidental in the greater number of cases. However, a slight degree of diverticulitis will produce definite and often marked symptoms.

Pain is the outstanding symptom of diverticulitis. It is variable in type, ranging from intermittent and sharp to constant and dull. It is usually below the umbilicus and most often on the left side. Constipation is usually present, though occasionally there is diarrhea. Abdominal distention and flatulence are often noted. An easily palpable tender sigmoid is almost always discovered and tumefaction is frequently present. Urinary disturbances are common because of the close proximity of the sigmoid and bladder with secondary involvement of the bladder wall.

Diagnosis.—Roentgen examination is the one procedure which definitely settles the diagnosis. Either the barium meal or the barium enema may be employed, but the barium enema is the more important of the two. Diverticula of variable size and distribution appear as rounded projections on the bowel contour. Deductions as to the presence of diverticulitis are made from the degree of spasm present. The length of the neck of the diverticulum must be noted. If the neck is long or the sac is seemingly isolated we have good evidence of thickening of the bowel wall. Fecal concretions in the sac appear as filling defects. Filling defects of the colon may occur either as the result of spasm or fibrosis with extrinsic pressure from reaction to the irritation. These can always be differentiated either by serial films or reexamination. Occasionally, the filling defect of diverticulitis simulates that of carcinoma. The differentiation here lies mainly in the fact that in diverticulitis some mobility of the wall usually remains while in carcinoma the wall is absolutely rigid. Also, diverticulitis usually affects a longer segment of the colon than does carcinoma and signs of diverticulosis are present in other portions of the colon.

Prognosis.—The prognosis under proper treatment is good. Patients will be kept symptom-free and free from complications under an adequate medical regime in all but a negligible percentage of cases. Surgical treatment is indicated only in the complicated cases.

Treatment.—In acute cases, rest in bed, ice bags to the abdomen, and irrigations with hot saline are indicated. The diet should be low in residue. When the condition is not acute, these patients should be instructed to take a bland diet and to take small doses of mineral oil three times a day. Constipation must be guarded against and it can best be prevented by proper diet and the use of mineral oil. Patients with diverticulosis would do well to observe similar precautions to lessen the danger of development of diverticulitis. Surgical treatment of the complications is too variable to be considered in this short time.

CONCLUSIONS

Diverticula occurring in the cervical region are the only type of esophageal diverticula of common clinical significance. They occur as the result of increased pressure causing herniation of the wall at the level of the cricoid cartilage. Their diagnosis is made from the history and X-ray findings. Treatment is surgical.

Duodenal diverticula are of primary and secondary types with a third group due to dilatation of the papilla of Vater or of the adjacent bowel wall. The significance of primary diverticula of the duodenum is usually exaggerated and in the vast majority of cases they cannot be held responsible for symptoms. X-ray establishes the diagnosis. A medical regime is indicated if it can be shown that a primary duodenal diverticulum is causing symptoms. Surgical intervention is necessary if a complication in duodenal diverticulosis arises.

Colonic diverticula are classified as: (1) diverticulosis; (2) diverticulitis—uncomplicated; (3) diverticulitis—complicated. They do not cause symptoms unless inflamed or unless complications occur. Their diagnosis is established by X-ray. Treatment is medical unless complications arise, when it becomes surgical.

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GLOBUS HYSTERICUS*

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PATIENTS with globus hystericus, we find, are prone to consult one who specializes in the nose and throat, although it is a symptom which has its origin outside the throat. The incidence of globus hystericus has more than doubled in the last two years, according to our records. This is due, no doubt, to the depression, with its financial worries and mental strain.

Having these cases thrust upon us, we were led to search for information. It was found that text-books do not help much. The subject is dismissed in a few words. Furthermore, not much is found in the literature of the last half century. Most of it is in German, written by neurologists. Nothing has ever been written by throat specialists. The literature deals for the most part with the theoretical rather than the practical aspect of the problem.

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SCOPE OF PRESENT STUDY

It is the practical aspect that this paper will emphasize: how to recognize this condition, and how to treat it. We shall discuss the symptoms by describing what we consider a typical case. Then we shall mention some atypical forms. Thereafter the etiology and pathology can be discussed to better advantage. Finally, what to do for them.

This study is based on twenty-four consecutive cases extending over a period of four years, in an eye, ear, nose and throat practice.

A TYPICAL CASE

This is our conception of the typical globus hystericus patient. Being predominantly female, we shall speak of "her." She wears a drawn, care-worn expression. She has a peculiar throat trouble which she believes must be serious. She feels a "ball," "lump," "pressure," or "tightness" in her throat. It feels as though she should be able to swallow it, but fails. It appears and disappears suddenly and unexpectedly during the day. She wonders if a food particle might be lodged there or whether it might be adenoids, a goiter, cancer, or some horrible disease. We now suspect globus hystericus. Upon questioning her, we find the trouble starts later in the day while about her work, especially when she is tired. She has noticed that she never has it when visiting, when having a good time, or when she becomes absorbed in something interesting. She is of a "nervous" disposition, and more so since this trouble began.

Although it is only for the purpose of assuring the patient, we now make an examination, which we expect to be negative. The outside of the throat is palpated. The pharynx and larynx are viewed through mirrors. If she has worried about foreign bodies, a finger is slipped down the throat to convince her of the thoroughness of the examination. No intimation is given to the patient as to the nature of her trouble until this examination is completed.

We now settle down and have a heart-to-heart talk. She is told that such cases are not unusual. We tell her we found nothing wrong in her throat. We explain that she has a nervous disorder. Some sort of worry, or deep anxiety, is at the bottom of it. At this point some patients will tell the rest of the story. It may be money matters, family troubles, grief, or failing health. But often they are incredulous. Often they are not conscious of any worry or anxiety. The patient is then drawn out at length on matters concerning her private life. In some cases we have found it of advantage to have the patient go home and to return a day or two later.

Twenty-two, or 96 per cent, of our patients had symptoms corresponding very closely to this typical one. One of the two exceptions complained of a feeling of discomfort in the left side of the throat. The other exception was remarkable. She had a "metallic taste" in her throat, which would come and go exactly as the lump in the typical cases. The literature mentions atypical cases which are associated with stomach neuroses. Bilz[1] describes at length the case of a young girl in whom a foreign body seemed to rise gradually from the abdomen up into the throat.

ETIOLOGY

It was found that during the period covered by this study about one in every 400 cases in a practice limited to eye, ear, nose and throat was diagnosed globus hystericus. Of twenty-four cases, the age limits were seventeen and forty-five, the average being thirty-three. Eighteen were females and six males, indicating a ratio of three to one.

The causes can be summarized as follows:

Worry	8
Sexual neuroses	5
Monotony or drudgery	4
Doubtful or undetermined	7

Worry is responsible for more than a third of the cases. Money and family troubles are the principal causes of worry. One had a fear of cancer, another of tuberculosis. One of the cases under this class was remarkable. This was the one referred to above as complaining of a "metallic taste" in the throat. A young girl, a teacher, had quarreled with her lover, and as a result joined a "wild party." She was led into indiscretions which brought remorse and fear of consequences. After much urging, she was induced to go to her family physician for examination. For two or three weeks he was uncertain as to her condition. When she was finally informed that she was not pregnant, the metallic taste immediately disappeared, never to return. This case was therefore proven to be a true globus, in spite of the unusual symptoms.

Sexual neuroses were found responsible in four cases, all in married women. Two of these were irregular sex practices (coitus interruptus). Another was vaginismus in a young bride. Treatment was advised by her family physician to whom she was sent, but was refused. If she had accepted the treatment as advised, no doubt her globus could have been cured. The fourth case was a woman who had begun to use contraceptives for economic reasons, although she believed that to do so was immoral, and admitted that this was continually on her mind.

CHART 1

Case	Age	Sex	Etiology	Immediate Results	Remote Results
1.	33	F	?	Disappeared	Cured
2.	17	F	?	Disappeared	Cured
3.	37	F	Worry	Disappeared	Cured
4.	24	F	Sexual neurosis	Improved	Improved
5.	45	F	Monotony	None	Worse
6.	35	F	Worry	Improved	No change
7.	37	F	?		
8.	32	F	?	None	Cured
9.	24	M	Monotony	Slight improvement	Cured
10.	40	F	Worry	Improved	Recurrence
11.	33	M	?	Disappeared	Slight recurrences
12.	34	F	Worry	Disappeared	Slight recurrences
13.	24	F	Sexual neurosis	Disappeared	Cured
14.	28	M	?	Disappeared	Cured
15.	39	F	Worry	Disappeared	Cured
16.	44	F	Worry	Disappeared	Cured
17.	30	M	Monotony	Improved	Cured
18.	45	M	Monotony	Disappeared	Cured
19.	36	F	Worry	Diagnosed laryngitis by another	
20.	26	F	?		
21.	21	F	Sexual neurosis	Disappeared	Cured
22.	38	F	Sexual neurosis	Disappeared	Cured
23.	22	F	Sexual neurosis	No change	No change
24.	39	M	Worry	Improved	Cured

In the four cases in which monotony or drudgery is given as a cause, there were three men who were overworked in their regular occupation. One was a physician who diagnosed his own case and cured himself by getting help and taking up golf.

It should be mentioned that, of the seven cases in which the cause was undetermined, four were in the early part of the series. We feel that if these early cases had been studied as carefully as the later ones, causes would have been found for at least some of them. We believe now that sexual neuroses are etiological factors more often than this report indicates, due to the difficulty of getting frank statements on such matters. In Bilz's case, referred to above, there was also a large element of sexual neurosis. Buch[2] also, in his long article, touches on the relation of sexual neuroses to globus.

PHYSIOLOGY OF GLOBUS

The evolution of theories as to the mechanism of globus hytericus is described by Buch. It was believed up to the seventeenth century that the condition was an actual migration of the uterus (or ghost of the uterus) into the throat. In the time of Hippocrates, it was believed "that the uterus was a living creature, which feeds on masculine semen, and when this means of nourishment was too scanty, looks around for other sources, and so in hypochondriacs it wanders upwards as high as the throat." Later, it was thought to be a spasm caused by peristaltic mo-

CHART 2

Immediate Results

Cured	12
Improved	5
No change	3

Remote Results

Cured	14
Improved	1
No change	2
Worse	1
Recurrences after disappearance or improvement	3
Wrong diagnosis	1

tions ascending from the abdomen up the esophagus. In 1851, Romberg maintained it was not a spasm of the esophagus but a neuralgia of the respiratory and gastro-intestinal tract. Other theories were: a sensory disorder;[3] a visceral neuralgia and paresthesia; Charcot believed it had a connection with the ovaries. Buch believes it is a sensory neurosis of the sympathetic system. He states he has produced the globus sensation by pressure on a plexus in the pelvis at the level of the last lumbar vertebra. By some it is believed to be a contraction of the cricopharyngeus muscle. A rheumatic origin has even been claimed.[4] Jacobson[5] of Chicago, in 1924, reported experiments using barium paste X-rays of the esophagus from which he concluded that there is a spasm of the esophageal muscle. He thinks that hyperesthesia of the throat may also be a factor. The nature of this strange symptom is, therefore, still a problem. Buch says, "We have no analogy, in the realm of pathology, to the globus sensation."

TREATMENT

Having discovered the cause, an attempt is made to convince the patient that such is the cause. The success of treatment depends on one's ability to make the patient accept the diagnosis of globus. With some, that is extremely difficult. Three of the patients insisted on having X-rays of the throat.

Seventeen out of the twenty-four patients never returned after the first consultation. For the purpose of making this report, a questionnaire was sent out, and contacts were made in all except two cases. Chart 1 shows a summary of the cases. Chart 2 summarizes the results of treatment. These results have been gratifying. It should be noted that Case 23, one of the few with unfavorable results, is the one referred to previously as having refused corrective treatment for vaginismus as advised. In another unfavorable case, No. 6, there was no chance to remove the cause of the patient's worry; she was the mother of seven children and her husband had been sent to the state prison at Stillwater. The one essential part of the treatment is to convince the patient of the nature of her ailment. As stated before, she is told that it is a nervous disorder which has some underlying cause; that if possible this underlying cause must be found and removed. The word "nervous" is satisfying to patients. The word "mental" seems to embarrass them, so is never used. In handling these patients, it is advisable to assume a serious, sympathetic manner. The idea of a relation between worry and the lump in the throat, of course, never fails to surprise them. It must be pointed out tactfully.

Six of the patients stated they had previously consulted other physicians without being benefited. Two had been given prescriptions and local treatment to the throat. Three had had their tonsils removed. Of these latter three, two were made worse. This is exactly what one might expect, for the reason that the failure of the operation to cure would be just one more cause for worry.

The sixth patient had been told that there was nothing wrong with her. This, of course, is a glaring mistake. Every globus patient knows there is something wrong. When that patient was given our routine treatment, that is, told that she did have a definite throat trouble, a sort of nervous spasm, and that the cause must be removed, she was cured immediately.

SUMMARY

Globus hystericus is a rather common condition, although little seems to have been written on the subject. It is often unrecognized.

The theory of its physiological mechanism is not well established, but it is probably a muscular spasm.

It may be caused by worry, monotony, or drudgery, or sexual neuroses. Its treatment is psychic and has been found surprisingly satisfactory. All local treatment is contraindicated. Immediate and permanent results were obtained in a high percentage of cases.

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EMERGENCY TREATMENT OF EYE INJURIES*

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A VERY careful emergency examination is necessary for every eye injury of any significance. Even the most trivial command respect, for these sometimes cause blindness in spite of the most competent treatment, while severely injured eyes, on the other hand, often respond beyond the fondest expectations. Complications, as hemorrhage, irido-cyclitis, retinal and choroidal tears and detachment, often cause disappointment when the external structures are uninjured. The final outcome of many injuries cannot be estimated until several months have elapsed but immediate examination and treatment often saves much vision and considerable suffering. Accidents are rapidly disappearing in industrial plants. The effective use of goggles with or without unbreakable lenses, safety devices, proper medical care, and education of the employee have all helped. The removal of foreign bodies in the eye by the fellow mechanic who is handy at it, is almost eliminated. In the New York eye infirmary only thirty cases of intra-ocular foreign body cases were observed in 1930 while twenty-five years ago it was not uncommon to see five or six in a single afternoon. At the present time, more intra-ocular foreign bodies are seen in farmers and children than mechanics. The use of dynamite by farmers accounts for the frequency among them.

There are two very important considerations in the examination of injured eyes: first, sufficient illumination; and second, magnification enough to make the smallest of foreign bodies and wounds visible. Even the corneal microscope is sometimes necessary, for this procedure often reveals valuable information otherwise undiscoverable. Recently, I discovered an almost microscopic piece of steel resting in the iris twenty-four hours after the patient had a slight stinging sensation while pounding on an automobile shaft.

The most common of all injuries is the foreign body in the cornea. In industrial centers, these are imbedded metals with oxidized bases which leave a brown stain when the foreign body is removed. Removal of the stain is essential. Should it remain, convalescence is delayed, and vision may ultimately be reduced. A sharp foreign body spud, or the dental burr will effect its removal satisfactorily. Cauterization following removal prevents infection and stimulates healing. As in the infected ulcer following injury, the eye is anesthetized with cocaine or butyn, the area dried and touched with phenol, iodine, or tri-chloracetic acid applied on a finely pointed applicator. All of the above caustics are satisfactory, but tri-chloracetic acid produces much less after-pain and is always effective. An anesthetic ointment of holocaine or butyn, plus a pad and adhesive, insure comfort for the next twenty-four hours.

In the event no foreign body is found, fluorescein, which stains effectively, should always be used to elicit abrasions or incised wounds. Its routine use in ophthalmic practice is almost universal.

When incised wounds of the lids are present, disfigurement often results from lack of approximation. This may be remedied by suturing the lid margin first, passing the suture entirely through the margin of the lids.

Burns of the eye are produced by hot metals, acids, alkalies and freezing mixture of ammonia. The relief of pain and prevention of adhesion (symblepharon) are most important. Caustic alkalies and slaked-lime burns which produce the most serious results should be painted with U.S.P. Glycerite of Tannic Acid. This stops the destructive action of the agent and prevents marked opacification of the cornea. The immediate appearance of a burned conjunctiva may not show the final condition unless the destructive action of the chemical is neutralized at once. Relief from pain may be obtained with anesthetic ointments, which are more satisfactory than aqueous solutions.

Incised wounds, penetrating the chambers, require immediate disinfection and closure. Conjunctival flaps after VanLint method, or the sliding flap, have saved many eyes otherwise hopelessly lost. Excision of a prolapsed iris should be practiced before suturing the flap. Replacing a prolapsed iris is rarely advisable. The conjunctival flap usually recedes in four or five days, leaving a solidly healed scar. Adhesion of the conjunctiva to the cornea seldom occurs and is easily separated with a spatula.

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Scleral or mattress sutures such as are used in ventral hernia will suffice to close a scleral rupture. The prognosis should be guarded and early enucleation practiced in the more severe penetrating wounds. A decreased tension, evidence of severe uveitis with leukocytic deposits upon the posterior surface of the cornea, is always serious. The absence of ciliary injection must not be relied upon too greatly, for sympathetic ophthalmia occurs when the exciting eye is apparently quiet, except for changes in the posterior chamber.

Traumatic cataract is always difficult of removal and the loss of vitreous should be guarded against. Its fluidity is taken for granted after such accidents. Vitreous loss, the most serious complication of intra-ocular surgery, ultimately gives poor results in a majority of cases. If the nucleus is small or absent a small anterior incision with the packet flap, has proved most satisfactory in my hands.

Contusions, producing hemorrhage, dislocation of the lens, and retinal detachment, are not uncommon. Rest in bed, and local applications are most beneficial. Retinal detachment may be cured in a small percentage of cases by skillful operative procedure, but its results are disappointing in many cases, as each and every operative procedure is a decided gamble, with something to gain and little to lose. Much has yet to be learned in spite of the already tremendous advance already made.

The problem of the intra-ocular foreign body is always a serious one. The type of metal, site of entrance, the projectile force and its position in the globe are all factors which must be considered. Localizing X-rays are absolutely necessary before any attempt at removal is made. Some foreign bodies are well retained within the globe for many years without causing serious trouble and their removal is not always the best procedure. Copper, although not well retained, usually causes less damage than the trauma produced by its removal. As pointed out by Kiehle, the first result is not the final result and vision may deteriorate after months or years, even though normal vision was present immediately after operation. The route of removal is also of prime importance. One pathway of entrance and removal is to be preferred, and where the lens is uninjured, the posterior route is chosen. With very small foreign bodies, however, which can easily pass around the zonule of the lens, this is to be desired to making another thrust into the vitreous body. Enucleation is no longer considered necessary simply because an eye harbors a foreign body. Bulson, a few years ago, reviewed the published cases of retained foreign bodies. The damage resulting was sometimes slight even after many years. Parson states that most intra-ocular foreign bodies should be removed and always offer a bad prognosis. He excepts cases, however, that have sterile foreign bodies, without irritation, no reduction of visual acuity, and the removal of which will undoubtedly destroy vision. Prognosis should only be given after the lapse of considerable time.

Following severe injuries with infections, and in traumatic inflammations, the valuable adjunct, non-specific or foreign protein therapy, offers the greatest single curative agent. Whatever may be the feeling of the general medical man regarding foreign proteins, as milk and typhoid vaccine, their use in ophthalmology is well established and unquestioned. Many prefer 10 c.c. of boiled milk but a long series of cases treated by small doses of typhoid vaccine intravenously, has given very satisfactory results. This treatment is not without its danger, however. Large doses of sodium salicylate, approximately 1 grain for each pound of body weight, in a starch retention enema is admirable for aged persons or those in whom the vaccine may be contraindicated. Recently Benedict has advocated colloidal gold for the same purpose with good results.

In cases in which the inflammatory reaction is out of all proportion to the injury sustained, endogenous infection may be the exciting factor which keeps up the inflammation. Latent syphilis is often excited by injury and even when there are no other clinical signs, an ocular inflammation may be due to this infection. Generally cases of this type do not respond to anything but specific treatment. Tuberculosis may also be present and be aggravated by injury, although there is usually evidence of pre-existing ocular disease before the injury has taken place. A complete physical examination reveals the cause of such inflammations as are not produced by trauma alone.

Conclusions.—Ocular injuries, of any significance, require a very careful examination, sufficient illumination, and magnification. Aseptic removal of foreign bodies and cauterization of the area results in early healing. Alkali burns are best treated with glycerite of tannic acid. Perforating injuries should have the wound closed by means of conjunctival flap after excision of the prolapsed iris, if necessary. Intra-ocular foreign bodies are serious problems which require considerable experience and X-ray localization before removal is attempted. Pre-existing infections complicate the picture, especially when such infections are endogenous.

OCULAR LESIONS OF GENERAL DISEASES*

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During the past few years internists have begun to realize that eye examinations in certain general diseases are of value in diagnosis and prognosis. A knowledge of the clinical pathology of the eye in general diseases is indispensable. An examination of the fundus of the eye with the ophthalmoscope is becoming an important procedure in the general physical examination of the patient. A summary of the ocular lesions most likely to occur in some of the most frequent general diseases follows:

Exophthalmic Goiter: The general disease of which the eye signs are best known is that of exophthalmic goiter. The exophthalmos is usually bilateral, but occasionally is unilateral. However, the exophthalmos may even be absent. Von Graefe's sign is present if the upper lid does not follow downward movements of the eyeball. Dalrymple's sign consists of retraction of both the upper and lower lids. If decreased winking occurs this is known as Stellwag's sign. When convergence of the eyes is hindered Moebius' symptom is present. Gifford's sign is difficulty in everting the upper lid. When the head is bent forward and the patient requested to look upward and no wrinkling of the brow occurs this is known as Joffroy's sign. On closing the lids a fine fibrillary tremor of these structures is sometimes noted in normal patients, but in cases of goiter it may be very pronounced. This condition is called Rosenbach's sign. Other less frequent symptoms are swelling or edema of the lids, pigmentation of the lids, and paralysis of extra-ocular muscles.

Syphilis: Syphilis may invade every part of the eye. Many cases of orbital periostitis are due to lues. The affected portion of the orbit becomes swollen and hard, the skin overlying it reddened.

Syphilitic lesions rarely appear on the eyelids. The lid may be the seat of a chancre either on the skin or on the conjunctival surface. In the tertiary stage a gumma may appear in the lid.

Interstitial keratitis is the most frequently seen ocular lesion of syphilis. About 90 per cent of the cases of interstitial keratitis are due to lues, the remainder being due to tuberculosis. The symptoms of an interstitial keratitis are decreased vision, pain, photophobia, and lacrimation. A round cell infiltration appears in the middle and deep layers of the cornea and the latter becomes lusterless and dull. New formed blood vessels resembling a brush appear in the deeper layers of the cornea. Interstitial keratitis is usually due to a congenital lues; very rarely to the acquired disease. It appears most frequently between the ages of five to sixteen, but may appear as late as the fortieth year.

About 50 to 60 per cent of the paralyses of the extra-ocular muscles are due to lues.

Retinitis, choroiditis, or chorio-retinitis may be due to lues. Ophthalmoscopically it is difficult to determine whether they are due to either lues or tuberculosis. The differential diagnosis depends largely on clinical and laboratory findings. Accompanying "dust-like" opacities in the vitreous are more characteristic of lues. In syphilis the choroidal lesions are usually more sharply circumscribed, smaller and more rounded in outline.

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Acquired syphilis produces approximately 50 per cent of the cases of iritis. In some instances the iritis showing the characteristic posterior synechiæ, precipitates on the posterior surface of the cornea, indistinctness of the iris markings, and ciliary injection cannot be differentiated from one due to other causes. However, there is a form of luetic iritis which is different from others. In this case nodules appear in the iris. They have a yellowish-red color, are the size of a pin's head or larger, and are situated on the outer or inner margin of the iris, rarely in the middle. Later the nodules disappear and leave at their site broad and firm posterior synechiæ.

Optic neuritis, choked disc, and primary optic atrophy may be produced by a tertiary lues but ophthalmoscopically they cannot be differentiated from those due to other causes.

Tuberculosis: Tuberculosis of the eye is rarely found in patients under treatment for active tuberculosis. Primary tuberculosis of the eye is very rare. For this reason a tuberculous eye lesion depends on the presence of a tuberculous lesion elsewhere in the body and very frequently a careful physical and X-ray examination are necessary to locate this lesion, which is usually quiescent or healed and located in the lungs, tracheobronchial glands, or hilus lymph glands.

In an orbital tuberculosis the temporal margin and the zygoma are most frequently involved. At first induration and swelling occur at these sites. Later the abscess ruptures and leaves a fistula. On probing, denuded and roughened bone can be felt.

Tuberculosis of the lids usually occurs in children; it is very chronic, non-painful, and usually unilateral. The lid is thickened. If ulcers are present they are irregular in shape with reddened and livid borders. In the later stages there is puckering.

In the conjunctiva, tuberculosis produces irregular dirty gray ulcers. Grayish red granulations protrude through necrotic material in the bases of these ulcers. In the vicinity small gray nodules (tubercles) may be seen.

Tuberculosis of the cornea is very similar to leutic interstitial keratitis. Usually the differential diagnosis must be made by means of the Wassermann and tuberculin tests. However, the tuberculous infiltration may be more limited to one portion of the cornea than the luetic infiltration. Beginning at the limbus, tongue-like projections protrude into the parenchyma. Lesions of the cornea are usually associated with an episcleritis and uveitis.

Tuberculosis of the iris produces either miliary tubercles or a chronic iritis. The tubercles may arise simultaneously in different locations. Usually they appear as small, gray, transparent nodules. The blood vessels surrounding them are congested. The chronic iritis is characterized by posterior synechiæ, deposits on the anterior capsule of the lens, pupillary membrane, and large lardaceous (mutton fat) deposits on the posterior surface of the cornea. Secondary cataract is a frequent complication.

Tuberculosis of the choroid appears for the most part under the form of isolated foci of inflammation scattered over the choroid. When examined with the ophthalmoscope they appear as yellowish, indistinctly outlined spots which lie beneath the retinal vessels. The overlying retina is clouded and gray. The vitreous is usually slightly turbid although not as pronounced as in syphilis. These exudates soon disappear leaving an atrophic choroid. If complete atrophy occurs the spot is white from the white sclera shining through. Later there is a proliferation of pigment so that these spots appear lined with black pigment or covered with black spots. These lesions are then characterized as cicatrices of the choroid. On account of the close proximity of the retina there is frequently an associated lesion of the retina producing a chorio-retinitis.

Tuberculosis of the retina produces either tubercles or periphlebitis of retinal vessels. Small miliary tubercles are found in the macular region. Larger tubercles either solitary or coalesced may be found anywhere in the retina. The tubercle is usually yellow and surrounded by a halo of edema in the early stage and pigment later. A periphlebitis associated with hemorrhages into the retina is a very characteristic tuberculous condition. The exudates are yellowish and gray. They are seen most frequently at the points of crossing of the arteries over the veins and at the bifurcations of the veins.

Tuberculosis of the optic nerve is rare.

Diabetes: The two most frequent eye complications of diabetes are retinitis and cataract. There is considerable disagreement in the literature as to whether or not there is such a thing as diabetic retinitis. Many authors claim that diabetic retinitis does not exist. They stress the fact that diabetic retinitis never occurs in children. In adults they claim the retinal changes are due to vascular or renal pathology. When there are neither clinical nor laboratory signs of either vascular or renal disease in a case of diabetes with retinal changes these authors attribute the changes to a slowly developing chonic nephritis. However, the great majority of authors claim that there is such a condition as diabetic retinitis and that it can be differentiated from a retinitis due to renal or vascular disease. In diabetic retinitis the exudates have sharp edges with a soapy or waxy appearance. The exudates are smaller in size than in renal retinitis. The star figure in the macular region is rare in diabetic retinitis but frequent in albuminuric retinitis. In diabetic retinitis there are no soft edge cotton wool patches, and no retinal edema. Hemorrhages are frequent in diabetic retinitis. They usually occur in the deeper layers, hence they are circular, and frequently they rupture the hyaloid and diffuse into the vitreous.

In young people diabetic cataract is usually bilateral. It begins in the posterior cortical layer, and develops rapidly. In elderly people it is difficult to differentiate a diabetic cataract from other types. It usually begins in the anterior cortical layer and develops rapidly.

Other eye complications of diabetes are optic neuritis, palsies of the ocular muscles, changes in refraction, iritis, vitreous opacities, optic atrophy, thrombosis of retinal vessels, changes in the color of the retinal blood, retrobulbar neuritis, and hemorrhagic glaucoma.

Nephritis: The outstanding eye complication of this disease is albuminuric retinitis. The pathological changes are due to exudates, hemorrhages, and edema. In the early stage the exudates appear as large, white, indistinctly outlined areas, usually located in the posterior portion of the eyeball. These are the so-called cotton wool patches. They are usually accompanied by hemorrhages both round and flame shaped. Later the exudates become smaller and their edges more sharply defined. Still later the exudates are completely absorbed leaving pigmentary changes behind. Often these exudates arrange themselves in such a manner that they form a star figure in the macular region. The star figure is not limited to albuminuric retinitis but may also appear in the retinitis of arteriosclerosis. Choked disc frequently accompanies the exudates.

Arteriosclerosis: During life there is no better place in the body than the eye to observe vascular changes. Arteriosclerosis first produces a sclerosis of the retinal arteries shown by an increase in brilliancy in the central light reflex. As the disease progresses the arteries become more rigid, the blood column becomes smaller and the arteries seem to be contracted. They then compress the veins at the crossings. The terminal arterioles become very tortuous, resembling corkscrews. As the disease advances still farther the caliber of the main arteries begins to vary in size. Later the blood column becomes very narrow and the walls of the vessels become streaked with white, producing the so-called pipe stem sheathing. Small round also flame shaped hemorrhages occur in the retina. The hemorrhages may be accompanied by whitish or yellowish exudates. The exudates and hemorrhages are usually small in size and located near the macular region.

Multiple Sclerosis: The principal eye complication of this disease is retrobulbar neuritis. On ophthalmoscopic examination there is found to be pallor of the inferior temporal quadrant of the disc. Frequently only one eye is involved. The pallor never progresses to a complete optic atrophy. Usually there are marked defects of vision, but complete blindness never occurs. The most frequent field defects are central scotomata and contracture of the upper temporal field. Sometimes the pupils are of unequal size. In the later stages of the disease myosis is common. Almost any combination of paralyses of the extra-ocular muscles may occur, but the most frequent is a unilateral or bilateral external rectus paralysis. Nystagmus is nearly always present.

Epidemic Encephalitis: Epidemic encephalitis produces some unusual eye complications. Paroxysmal spasmodic deviations of the eyeballs occur either upward, downward, or laterally. The eyes become fixed in one plane frequently with a fluttering or an enforced closure of the eyelids. A roll-like motion of the eye may be elicited when a patient is placed in a darkened room and a concentrated light beam is directed toward the eyes. Various paralyses of extra-ocular muscles have been noted. A great variety of pupillary signs have been described in cases of epidemic encephalitis. Argyll-Robertson pupil occurs frequently. If anisocoria occurs it may be long-lasting or temporary. The ability to converge the eyes is frequently lacking.

Diseases of the Accessory Nasal Sinuses: Diseases of the nasal accessory sinuses may act as a focus of infection for an iritis, iridocyclitis, or possibly a chorio-retinitis. A small percentage of the cases of retrobulbar neuritis are due to sinus disease, the far greater percentage being due to multple sclerosis.

Basal Lesions of Frontal Lobe: Basal lesions are found in 15 per cent of all frontal lobe tumors. If the basal lesion is unilateral it produces certain changes in the eyes which collectively are known as the Foster Kennedy syndrome. This syndrome consists of central or cecocentral scotomata with optic atrophy on the same side as the lesion; and normal vision with a choked disc on the opposite side. The optic atrophy on the same side as the lesion is not present in every case as sometimes the disc is normal, pale, or choked.

Brain Abscess and Tumors of the Brain: These diseases produce a great variety of combinations of ocular changes depending on their location in the brain. The changes are principally field defects, paralyses of extra-ocular muscles and either choking or atrophy of the disc.

Trichinosis: In this disease there is sometimes redness and swelling of the bulbar conjunctiva overlying the external and internal rectus muscles. There may also be an edema of the lids. Movement of the eyes produces pain due to the involvement of the extra-ocular muscles of the eye along with the other muscles of the body by the trichinæ. Other ocular lesions sometimes noted are exophthalmos, conjunctival ecchymosis, midriasis, and retinal hemorrhages both superficial and deep.

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THE TREATMENT OF EPIDERMOPHYTOSIS*

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EPIDERMOPHYTOSIS or trichophytosis has become increasingly common during the last decade. In private dermatologic practice it ranks with eczema and acne in the incidence of cases seen. In a large dispensary practice such as that of the New York Skin and Cancer Hospital, from 1913 to 1927, epidermophytosis was ranked seventh or eighth in order of frequency of diseases noted, whereas in 1928 and 1929 the condition had progressed to second place. In many instances the presence of infection is discovered in the course of routine examination of the patient for other reasons. These dormant cases are none the less important from the standpoint of public health. Examination of students in universities discloses an increasing incidence of ringworm year by year; it has been stated that 70 per cent of senior medical students have epidermophytosis.

The clinical picture is definite. The sites of predilection are the webs between the toes, the nails, the plantar surfaces, and less frequently the groin, the hands, and the glabrous skin. The morphologic characteristics are determined to a large extent by the nature of the soil. In the presence of hyperhidrosis the picture is chiefly intertriginous, with scattered vesicles which have a tendency to coalesce. Where the skin is dry, the keratotic manifestations predominate.

To distinguish properly ringworm of the feet from other dermatologic affections, it is essential that the fungus be demonstrated. Identification of the organism is usually possible by examining scrapings, scales, or macerated tissues in a 10 per cent solution of potassium hydroxide. The nails require a stronger solution for a longer period of time. When vesicles are present, it is customary to decapitate a vesicle, invert it on a slide, and cover it with the solution of potassium hydroxide until the epithelial débris is sufficiently digested. The mycelial filaments are best seen in the microscopic field in diffused light. Cultural methods find their chief value when it is desired to distinguish the species of fungi, and are not of great practical value.

The remedies that have been prescribed for treatment of epidermophytosis are legion; their very numbers bespeak their inadequacy. To prove the fungistatic power of drugs on cultures of fungi does not necessarily demonstrate their fungicidal capacity in regard to the infection in tissues. A favorite standby is Whitfield's ointment, a combination of benzoic and salicylic acids, which is probably beneficial by reason of its exfoliative action. Thymol and the essential oils of clove and cinnamon have been recommended on the basis of fungistatic tests on culture. However, they have not found much practical application. Iodine in solution in benzol or acetone, in weak dilution, is very efficient. Recent research has indicated that certain mercurial compounds, mercury fuchsin and mercury crystal violet, are highly fungicidal as compared with the more popular but weak mercurochrome. A specific fungicidal remedy is not yet at hand, certain advertisements to the contrary notwithstanding.

During the acute vesicular stage of the infection, it is best to rely on the application of mildly antiseptic and soothing compresses and soakings, of which potassium permanganate, copper sulphate, and preparations of aluminum subacetate are most popular. In the more chronic stages, the use of occasional wet dressings will offset the irritating effects of the exfoliants and antiseptic chemicals. If there is considerable hyperkeratosis, Whitfield's ointment in full strength should be used, or a solution of salicylic acid in alcohol. Attention to the nails is most important.

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*From the Section on Dermatology and Syphilology, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, St. Paul, May 24, 1932.

Roentgen rays are employed not infrequently in practice, but their use should be controlled by experts. It is not unusual to see instances of actinodermatitis with evidence of active ringworm infection remaining in the same field. Roentgen rays find their chief application when there is marked hyperhidrosis, and a drying effect is desirable.

In the effort to develop more efficient fungicidal preparations, too little attention has been paid to the matter of prophylaxis and of prevention of recurrence or of reinfection. It is common experience that a particular form of treatment will not apply equally well to a number of patients, nor at different times to the same patient. The problem of individual predisposition is governed by factors often beyond the physician's control. Certainly obesity and hyperhidrosis favor warmth and moisture, which facilitate the growth of the fungus. The hydrogen-ion concentration of the sweat may account to a certain extent for individual differences in patients. The frequent application of soap and water, followed by a mild dusting powder, such as 20 per cent sodium hyposulphite in powdered boric acid, sprinkled in the hose, will serve to control a large percentage of the milder cases. Frequent changes of hose, as well as thorough drying of the shoes, are simple details which are readily overlooked. A period of mild treatment before the onset of warm weather is a most efficient preventive.

Wherever crowds of people gather to make use of public bathing facilities, the incidence of infection is usually increased. The use of tanks of sodium hypochlorite solution in a strength of 0.5 to 1 per cent has recently been proposed for rinsing the feet before and after bathing. The method is practical and successful to a high degree in prevention of epidemics.

Complications and systemic reactions to infections of the feet with Epidermophyton are not infrequent. Often the adjacent lymph nodes are enlarged and tender. Not infrequently there is phlebitis or cellulitis, with ascending lymphangitis. These may be due to the fungus or to secondary invasion by pyogenic organisms through the fissured skin. The fungus has been obtained in culture from infected lymph nodes and from the blood.

If the infection has been present for a time, a state of hypersensitivity may develop, characterized by the appearance of epidermophytids. These are systemic reactions which appear following hematogenous dissemination of the organism or its products to the sensitized skin. One sees vesicles on the palms and along the borders of the fingers, which are likely to be epidermophytids. Search in solution of potassium hydroxide for fungi is repeatedly negative when the specimens are from the hands, whereas microscopic examination of scrapings from the feet are positive. At times secondary manifestations overshadow the primary focus. Often the sites of infection, especially when on the hands, become exceedingly reactive to various external agents, such as soap, water, or materials used in various occupations, with resulting secondary dermatitis. In such cases the very mildest and most soothing remedies are to be recommended.

Extract of fungus, trichophytin, will provoke a positive dermal reaction in sensitized persons, both on intradermal injections and on application in a patch. The use of trichophytin has been advocated as a method of desensitization, but results so far have not proved encouraging.

A judicious program of treatment will include the best of the procedures mentioned, persistently applied. The most efficient fungicides alone, without recognition of the problem of prophylaxis and individual hypersensitivity, will fail to accomplish control of epidermophytosis.

CASE REPORTS

SUBCUTANEOUS RUPTURE OF THE URETHRA AND CORPORA CAVERNOSA

Walter Halloran, M.D.
Jackson, Minnesota

During intercourse, the patient, a married man, aged fifty-six, felt, as he expressed it, that something had gone wrong. He found himself bleeding from the urethra and the penis was rapidly swelling. There was no particular pain noticed. His past history was essentially negative.

The patient was examined by Dr. Rose, who gave a diagnosis of urethral rupture, and taken to the hospital immediately. Upon examination the penis was found to be markedly swollen, discolored and cold. Subcutaneous hemorrhages extended to the scrotum and there was bleeding from the urethra. About 5 cm. behind the corona of the glans there was an acute posterior angulation.

Under general anesthesia an incision was made on the under surface of the penis parallel to the urethra and over the area of maximum swelling. The urethra was found nearly torn in two, at a point some 6 or 7 cm. from the anterior meatus. The corpus cavernosum was also ruptured, its tissues filled with blood and a clot the size of a walnut was expressed.

The torn urethra was sutured and a retention catheter inserted. This was removed the third day, after which the patient was able to urinate normally. The wound healed without infection developing. This was doubtless due to the fact that the patient was seen and treated immediately before any attempt had been made to urinate and before catheterization had been attempted.

GAS BACILLUS INFECTION TREATED BY POLYVALENT SERUM

Walter Halloran, M.D.
Jackson, Minnesota

A married woman, aged fifty, sustained extensive lacerations of the right leg from broken glass in an automobile accident, May 27, 1932. The wounds were somewhat contaminated by dirt and debris. She received first aid treatment and the wounds were sutured before she was brought to the hospital.

The patient was put to bed, the leg was elevated and antitetanic serum given. The next morning there was considerable swelling at the site of the injuries, and those stitches under tension were removed. The following morning the leg was so swollen and painful that all the stitches were removed and Dakin's solution applied to the open wounds. The following day there was evidence of gas bacillus infection. The leg was edematous and crepitus was elicited on pressure. Both wound margins were black or a dirty gray and had a cooked appearance for an extent of two or three inches. A foul odor was noticeable. The patient was dull and toxic and complained of a great deal of pain in the leg. The temperature was 102.8 degrees; the pulse 118.

The wound was laid wide open and enough of the dead tissue removed to obtain free access to all areas of infection. The debridement was carried out under a light general anesthetic and tissue showing the presence of circulation was not molested. This resulted in a loss of skin and subcutaneous tissue 12 to 18 cm. in width completely encircling the leg above the ankle. Ninety c.c. of the unrefined polyvalent gas bacillus serum (Lederle) was given intravenously. About an hour later a rather severe chill occurred but the temperature dropped from 102.8 to 98 degrees and the pulse from 130 to 90.

The following afternoon the temperature was 100 degrees and the pulse 100. Thirty c.c. of the refined polyvalent serum was given subcutaneously and repeated in twelve hours and again in another twenty-four hours—four doses in all.

Improvement following the serum administration was as remarkable as that seen following the use of diphtheria antitoxin. The general condition of the patient immediately improved and the infection made no further progress. The gas formation ceased after the first dose of the serum.

The patient made an uneventful recovery and left the hospital after seven weeks. The denuded area was later covered by skin grafts.

The case illustrates the very satisfactory results occasionally obtained from use of the polyvalent gas bacillus serum and shows the danger of early suture of infected wounds.

RETROPERITONEAL MYXOLEIOMYOMA*

Martin Nordland, M.D., F.A.C.S.
Instructor in Surgery, University of Minnesota
Minneapolis

The patient, a man twenty-six years of age, had had, in December, 1929, a thyroidectomy for an exophthalmic goiter. Convalescence had been uneventful. A physical examination at that time revealed the presence of no abnormal masses in the abdomen.

He returned for examination in May, 1930, because of a persistent distress in the epigastric region, which at irregular intervals had been fairly severe. This pain was not related to eating or to bowel function, and likewise was not associated with any symptoms referable to the genito-urinary tract. Relief was obtained only from the use of increasing amounts of various mild sedatives. There had been a loss of a few pounds of weight, but this he attributed to worry and consequent poor appetite.

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*Presented before Minneapolis Surgical Society, October 6, 1932.

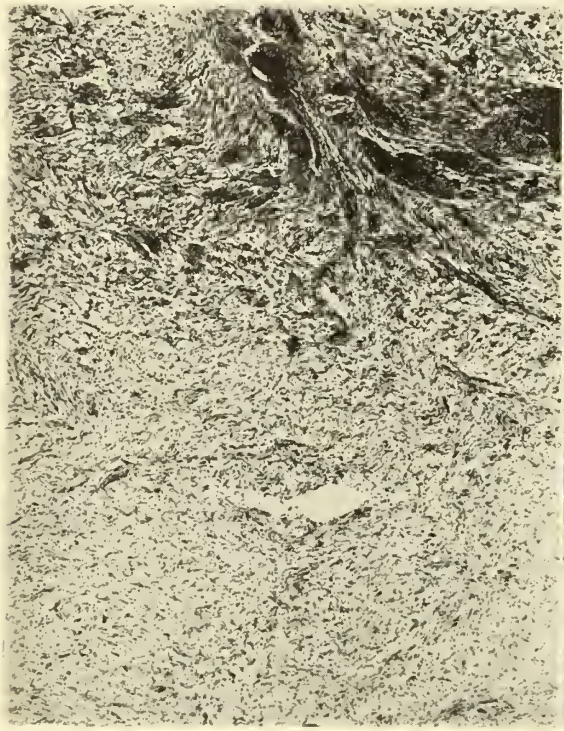

Fig. 1. Photomicrograph of tumor (low power). Note myxomatous structure as well as smooth muscle bundles.

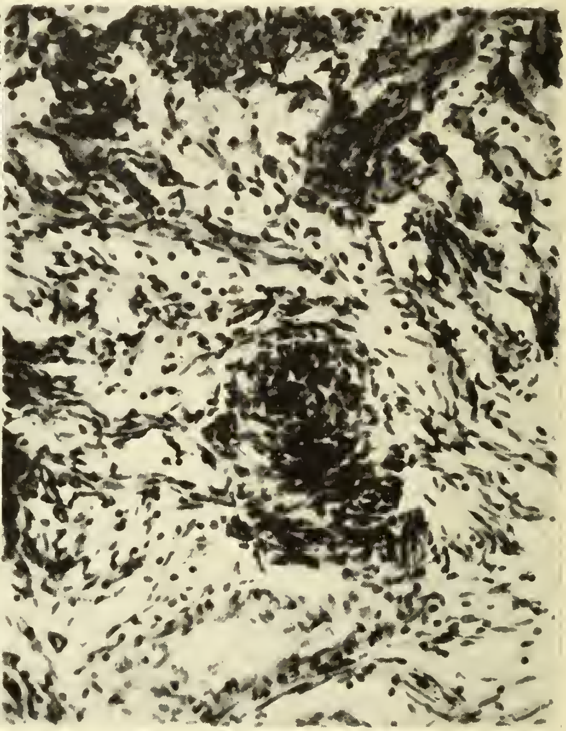

Fig. 2. High power. Large amount of mucinous material in association with myomatous areas.

Physical examination showed an essentially normal, healthy appearing adult. Except for a hard rounded fixed mass in the left portion of the abdomen, slightly above the umbilicus, there were no abnormal findings.

The hemoglobin concentration of the blood by the Dare method showed it to be 80 per cent of normal. The urine showed no findings of note and microscopic examination of a smear of the blood revealed no unusual type or number of cells. Roentgenographic and fluoroscopic study of the gastro-intestinal tract showed the transverse colon upwardly displaced by the tumor, but otherwise gave no further information as to the nature of the mass.

Exploration on May 12, 1930, through a left rectus incision, disclosed a large cystic tumor, situated retroperitoneally just below the ligament of Treitz. It was fairly well encapsulated and was removed completely without breaking into the mass.

Convalescence was without incident and the patient left the hospital on the fifteenth postoperative day. The patient was heard from in August, 1932, two years and three months after the operation, and was entirely free from recurrence, as far as could be determined.

Pathological examination was made by Dr. E. T. Bell of the University of Minnesota and was reported as follows: "The specimen is an encapsulated tumor, measuring 16 by 8 cm., composed of soft gelatinous looking material, yellowish pink in color, and oozes bloody serum. In the center are two hard masses of tissue each about the size of a walnut. Sections made for microscopic study show masses of involuntary muscle fibers with myxomatous degeneration. Diagnosis: myxoleiomyoma."

COMMENT

Tumors of the retroperitoneal region are of indefinite origin. The symptoms produced are vague and laboratory examinations are of no value; consequently, their diagnosis is fraught with difficulty. In about a third of these cases, the kidney capsule gives origin to these tumors, according to Judd and Larson,[2] while in the remainder, no structure can be implicated from even a careful study of the tumor or its surroundings. Pathologically, the structure of these neoplasms varies within wide limits from that of a simple benign lipoma, fibroma, myoma or myxoma, to that of the metaplastic highly malignant sarcoma. Various combinations of cell types are frequently present, such as lipomyxosarcoma, chondro-osteosarcoma, etc. Metastases take place in about a third of the cases and occur most frequently in the lungs, liver and regional lymph glands. These neoplasms are most frequently confused, clinically, with renal, splenic, liver or ovarian tumors and occasionally with a mesenteric or pancreatic lesion, as was done in the case reported above. Colonic and other intestinal neoplasms must be considered in the differential diagnosis of this condition.

The treatment of choice of this type of tumor is surgical removal. Too frequently, however, because of its size or attachment to blood vessels, ureters, intestine or other structures, excision is impossible. In these cases, radiotherapy may be of some benefit. In the operative removal of the tumor, wide resection is imperative, because of the marked tendency of these neoplasms to local recurrence. This is particularly true if the lesion contains any myxomatous structure, since material of this kind is especially prone to adhere to anything with which it comes into contact. Furthermore, it is also important to search for and to remove all smaller nodules which may be and occasionally are present alongside the main tumor mass (Judd and Larson).[1] The prognosis is good when the entire neoplasm can be removed, such as in the preceding case. When this is not possible, therapy with radium and roentgen ray offers hope of palliation and possibly of cure, depending on the degree of malignancy of the tumor.

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"A DUCK," SAID THE DOCTOR—"QUACK," SAID THE DUCK

This morning (ten days ago to you) we wave farewell to the valiant huntsmen who start forth in high spirits to capture the hostile duck. To many minds there is some question as to which is the more interesting bird—the duck hunter, or the duck. Each year the duck, bidden by some mystic call, leaves its comfortable summer home in the North to start its migratory flight southward. Whether they put their children in school in the South and spend their vacations in the North, or vice versa, is a point in natural history unknown to this ornithologist. It is a well known fact, however, that they start their trip each year just in time to give the Bronx cheer to the duck hunters who make annual journeys into the country to wave queer, hollow, smoking sticks at them when they go by.

The life history of the duck is very interesting. No doubt if more were known of it, it would equal in interest the habits of the duck hunter. It is not unreasonable to suppose that the ducks in their summer convention assembled were told of the coming eclipse and asked for the sake of science to observe and record the actions of hunters when the light of the sun was mysteriously obscured by the moon.

Accurate study of either ducks or hunters is tremendously handicapped because we can't understand the ducks and we can't believe the hunters. For example, many hunters tell us that they are actuated by a love of the beautiful out-of-doors in the autumn. Surely, appreciation of clear frosty air, brilliant foliage, and October skies is a great thing, but what actually happens? Our group of nature loving nimrods travel in droves of stinking cars over tarred roads to arrive in the evening at a suitable place—often designated as a hunting lodge. Until late in the night they sit around playing games of chance, drinking poisonous whiskey, smoking vile cigars, and telling stories entirely unfit for the drawing room. At four o'clock in the morning they roll out of their uncomfortable bunks. Shaking, shivering, snorting, swearing, stamping, and slapping, they pull on their boots and breeches to go to a still more uncomfortable place. Most any cold, dark, damp, disagreeable reedy recess that is half under water will do. Here they sit with their teeth chattering until rosy fingered dawn doth with a shaft of light the first duck point out.

Sometimes these hunters bring home ducks. Often, all they get is the above mentioned Bronx cheer from the web-footed enemy. No one outside the guild can really tell what goes on when hunters go hunting. With such meager knowledge it would be very unreasonable indeed for us to criticize them. We don't. If we are invited to a duck-hunter's house for dinner this fall we will accept with alacrity and will be very happy to sit down and eat our pheasants without a word.

Many doctors are duck hunters.—*Bulletin Hennepin County Medical Society, Oct. 10, 1932.*

THE B. & M. CASE

On July 19, 1932, in the Federal District Court, Baltimore, a flagrantly fraudulent "patent medicine" known as "B. & M." was declared misbranded. B. & M. Remedy is marketed from Boston by the F. E. Rollins Company. It is a simple liniment of, essentially, turpentine, ammonia and egg. The stuff has always been sold as a remedy for such serious conditions as tuberculosis, pneumonia, influenza, and a number of other pathologic states. In the case that has just been decided, the government brought suit against the F. E. Rollins Company, by way of seizure of this firm's goods, of false and fraudulent claims for therapeutic effects made for the preparation in a booklet issued by the company. This booklet was stated to have been prepared and much of it written by Dr. Herbert D. Pease of the Pease Laboratories, New York City, and according to the uncontradicted testimony in the case the firm had paid Pease $15,000, for which he was to revise their literature and give it a "scientific" background. The two outstanding features of the case were, first, the fact that it has been possible for years to sell broadcast to a particularly unfortunate group—the tuberculous—a fantastic fraud that does not have even the plausibility of ignorance in its favor, and that it was necessary for the United States government to spend thousands of dollars and expend untold effort to have it legally ruled as a fraud; second, is the outstanding spectacle of a Fellow of the American Medical Association selling his services to the exploiters of what is a self-evident fraud; and, greatest irony of all, for more than a quarter of a century the American Medical Association has been the one, and practically only, agency that, year in and year out, has endeavored to protect the public against just such frauds as B. & M. (Jour. A. M. A., August 13, 1932, p. 578.)

PRESIDENT'S LETTER

RECENTLY I saw in a theater a motion picture which depicted the sad predicament of a crippled child deprived of needed surgical services because there was no money. There is no need in this land for anyone to go without necessary surgical treatment if a hospital bed is available in a charitable institution, or if funds are provided to defray the cost in a private institution of food, heat, nursing, bedding and so forth. The inference of the motion picture mentioned was that members of the medical profession would not give of their skill unless the fees were assured. Nothing could be more untrue. Society never even considers that the grocer, the fuel merchant, and others should donate of their wares to the hospital as does the doctor who gives so freely of his wares; namely, his skill and time. This public criticism, for in our eyes it amounts to such, of our profession that one sees so often on the screen and reads in books is probably not taken seriously by the authors except so far as it makes the job of building up his narrative easier. If it were possible to compute the commercial value of the medical services rendered free to the public the sum would be so stupendous as to cast all other sums given for charity in the shade.

Industrial activities, in spite of erratic and uncertain periods of employment, have called more and more of our people to their lists. Also in many places owners have relinquished their farms to renters, and this has produced in rural districts, in this day of low prices for agricultural products, a body of citizens comparable with the employes of industry. From these two groups come many of the indigent sick. These, with a large number from other walks of life, in fact threaten the very existence of our method of practice of medicine. This condition of affairs calls for deep consideration and study by our organized medical bodies. Our secretary, Doctor Meyerding, is gathering much data about the care of the indigent sick, and it will be brought before the proper committees of our state society. In some sections of our own state, and in various other states, efforts have been made, and apparently with success, to bring about a sensible understanding with the authorities concerning the care of the needy sick. There is absolutely no reason why the medical profession should not be paid by the community a fair and equitable fee for their services to the poor. In some instances in which an understanding has been reached the county medical society has agreed to provide the medical services, the income being devoted to payment of dues to state and national societies, to the bringing of lecturers for graduate instruction, to the maintenance of a medical library, and so forth. The sooner organized medicine works out some sound, concrete plan flexible enough to fit varying local conditions the better for all concerned, including the needy patient, the taxpayer, and the physician.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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HYPERPARATHYROIDISM

In an article appearing on another page, a clinical entity is described, which is new, in the sense that its recognition has come recently. The pathogenesis of this condition is established and its arrest or cure has been effected.

Von Recklinghausen recognized the skeletal deformity, osteitis fibrosa cystica generalisata, and some relationship between this and the condition of the parathyroid glands was suspected, in 1904, by Askanazy. It remained, however, for Mandl, in 1925, to disclose the exact relationship and to effect the arrest of the disease by the removal of a parathyroid tumor. The reports of many other cases, similarly benefited, have followed, as well as the experimental reproduction of the condition by the injection of active extracts of parathyroid tissue.

The main criteria for the diagnosis of this disease are, first, the accompanying abnormalities in the metabolism of calcium and phosphorus, whereby a negative calcium balance occurs, and, second, the decalcification of the skeleton, with the replacement of bone by connective tissue. Multiple cysts develop in the bones, as well as giant cell tumors. The blood serum calcium is usually elevated several milligrams above the normal value of 9 to 12 milligrams per cent, while the corresponding figure for phosphorus is lower than normal and the excretion in the urine of both calcium and phosphorus is increased.

The roentgen appearance of the bones is diagnostic, provided the process is sufficiently generalized, but a localized or focal fibrocystic disease must be differentiated, as this is not accompanied by any disturbance of calcium metabolism and seems not to involve the parathyroid glands.

Generalized fibrous osteitis, as it appears in association with overfunctioning parathyroid tumors, and is produced experimentally by injecting Collips' extract, differs fundamentally from both osteomalacia and from the better known osteitis deformans (Paget's disease). In osteomalacia the decalcification of the skeleton is more uniform, the overgrowth of connective tissue, in the bone, is not much in evidence, hypercalcemia does not occur and the calcium balance is rarely affected. Endemic in the Orient, rare in Europe and America, preëminently affecting pregnant women, osteomalacia is now known to result from deficiencies, either of calcium or Vitamin D, and thus to be intimately related to rickets. Some general hypertrophy of the parathyroids may accompany it, but no actual tumors are seen, as in hyperparathyroidism.

Paget's disease and leontiasis ossea, in the past, have been grouped with von Recklinghausen's generalized fibrocystic osteitis in a category called osteitis fibrosa. This was incorrect and is now confusing. The pathogenesis of Paget's disease (osteitis deformans) and that of leontiasis ossea remain obscure and undoubtedly differ from that of the generalized fibrocystic disease of von Recklinghausen. The roentgenographs of the skeleton in Paget's disease bear a superficial resemblance to those of hyperparathyroidism, but differ in many particulars, as is especially noticeable in the shafts of the long bones. The bone cortex is usually thickened in Paget's disease, in contrast to the thinner than normal bone cortex in the fibrous osteitis of hyperparathyroidism.

There is nothing abnormal either in the serum values for calcium and phosphorus or in the excretion of calcium, in Paget's disease. There is no evident abnormality in the parathyroid glands and parathyroidectomy is without benefit, in contrast to the immediate subjective and objective improvement after the removal of parathyroid tumors in cases of hyperparathyroidism.

R. M. W.

SMALLPOX VACCINATION

The most outstanding example of successful prevention of disease through vaccination, a method confirmed by repeated world-wide experience of more than a century, is furnished in the case of vaccination against smallpox. Yet the public, and we may well add the medical profession, must needs be periodically prodded in order that protection against one of the world's worst epidemic diseases be maintained.

The medical profession would be remiss if it did not call the attention of the public from time to time to the importance of vaccination. Some are of the opinion that the medical profession should sponsor legislation requiring universal vaccination of school children. No doubt the enforcement of such a law would practically eliminate the disease. It has been demonstrated that compulsory vaccination saves lives, but, after all, the individual can protect himself against smallpox if he will. While compulsory smallpox vaccination would be salutary to any community there are those who question the advisability of advocating settlement of medical problems by legislators.

That group of individuals, the anti-vaccinationists, whose reasoning processes are so distorted for one reason or another that they see only the occasional accident resulting from vaccination and forget what a dreadful disease smallpox is, continues to be a thorn in the flesh of the physician—especially the one interested in public health. It is true that in rare instances people have died or become gravely ill following vaccination, as well as from other superficial abrasions. In recent years improper care of vaccinations has been responsible for most, if not all, secondary infections. Sight seems to have been lost of the fact that hundreds of thousands have died of smallpox and more have been disfigured by the disease for life.

Osler's inimitable challenge merits quoting:

> "I would like to issue a Mount Carmel-like challenge to any ten unvaccinated priests of Baal. I will go into the next severe epidemic with ten selected vaccinated persons and ten selected unvaccinated persons. I should prefer to choose the latter—three members of Parliament, three anti-vaccination doctors (if they could be found) and four anti-vaccination propagandists. I will make this promise, neither to jeer nor to jibe when they catch the disease, but to look after them as brothers, and for the four or five who are certain to die I will try to arrange the funerals with all the pomp and ceremony of an anti-vaccination demonstration."

The article on smallpox and vaccination by Dr. Westman in this number of the journal furnishes further statistical proof of the value of vaccination, and is a direct answer to false claims of local antivaccinationists. It stresses the need for repeated vaccination, a necessity many of us have not perhaps fully appreciated. A third of the school children throughout the state unvaccinated means the scene is already set for a return of a virulent epidemic of smallpox at any time.

THE PHYSICIAN AND POLITICS

The political campaign which is drawing to a close, although rather lacking in color, has aroused more than the usual amount of interest, coming as it does after three years of economic depression. There has been much talk and speculation as to the causes of the slump in business and naturally the political party in power has been blamed. That a change in party control in Washington would be a natural outcome has been generally predicted. It is probably a fact, however, that the past three years have been simply a phase in the cycle of economic adjustment of supply and demand such as has followed other wars.

We have learned about a "Hoover for president" organization of doctors. We also heard about a physician who on leaving for Europe notified his patients that if the fees owed him were not paid by the time he returned he would vote for Hoover; and that the fees were all paid.

There seem to be no clear-cut medical issues involved in the party planks. The interests of physicians are essentially those of the average citizen—the stimulation of business and the lowering of taxes. We have frequently expressed our belief that the government should not undertake activities which can be handled by private initiative. We as physicians can sympathize with others whose fields have been needlessly invaded by the government in competition. Government expense has mounted out of all proportion to increase in population, with the result that taxation has become unbearable. With these fundamentals in mind we approach the casting of the ballot. Fortunate it is that the majority of voters will feel the psychic uplift of the outcome, whichever party wins.

MISCELLANEOUS

SOCIAL INSURANCE

EDWARD H. OCHSNER, M.D.
Chicago, Illinois

COUNTER-SUGGESTIONS

The medical and dental professions of this country are giving the American public the best all-round health services ever enjoyed by any nation and are on the whole serving the nation as well or better than any other group of men. These two professions have a very general and most intimate contact with the citizens of the nation. No other professions are in so favorable a position to exert so great an influence for good as are these two if they will but use their opportunity rightly and wisely. If they are to accomplish the greatest possible good they must make still closer contacts with and exert still greater influence upon the political, social, and ethical life of the nation. These professions as a whole and as individuals must strive unceasingly and untiringly, in the future as in the past, for still further improvements in their respective fields. If unhampered by lay bureaucratic supervision and control in the future as they have on the whole been in the past we have every assurance that they will proceed to new and greater achievements; if, on the contrary, unduly hampered, we have every reason to expect medical service to deteriorate and medical progress to cease as it has already done in those countries whose governments have interfered the most.

In order to maintain the high standard of medical services prevailing, the professions must insist that the governments of the various states maintain high standards of requirements for admission to the practice of the professions. In order to accomplish this, continued education of the public in this regard is necessary.

The organized professions through their proper local organizations must see to it that all undesirables are weeded out and that the individual members render efficient service for adequate and yet reasonable fees. The professional man who makes unreasonably exorbitant charges for his services is even a greater menace to private practice than is he who charges too little. The former is the one to blame for most of the antagonism and resentment among the laity, while the latter because of his unfair competition makes it difficult for his colleagues to secure the necessary means for graduate work so essential to growth and progress.

Having presented to the attention of my readers through these articles the defects of Social Insurance as practiced at present in foreign countries and also having shown the dangers of such a system if allowed to become fixed upon the American Citizen, I offer as counter-suggestions that the government instead of wanting to take over new functions and new powers would do better were it to make every effort to perform acceptably the duties with which it now is entrusted. We of the medical and dental professions insist that the government give better medical services to its prisoners, delinquents, insane, paupers and government wards in general; that it give more serious attention to sanitation and hygiene, particularly to ventilation of public conveyances and places where large numbers of people congregate, and to the prevention of pollution of our sources of community water supply such as lakes and rivers.

The allied professions in conjunction with the government should give more serious attention to the teaching of personal hygiene in our schools, colleges and universities. Our educational institutions should teach the rising generation the value of integrity, industry, thrift and frugality, and that there is no substitute for these, not even legislation. Teach them that trying to keep up with the Joneses is not necessarily a virtue and that the installment buying of luxuries and trying to keep ahead of the Browns is poor business. Teach them that to learn how to get one's money's worth and to acquire a competence are much more worth while. Teach them that trying to get something for nothing, particularly through gambling, whether it be crap-shooting, poker, or buying stocks on margin, is fundamentally dishonest and almost invariably leads to disaster.

Better provisions for safeguarding the savings of our workers should be made and if there is no way of accomplishing this, there should be established a compulsory government insurance against sickness whereby the individual worker pays for his own insurance; in other words, separate entirely medical services and cash benefits. The physician should under no circumstances be medical advisor and insurance adjuster as he is in fact in all systems of Compulsory Health Insurance now in vogue.

Social Insurance is man's latest attempt at finding a means whereby social justice may be attained. But like all panaceas so far advanced it is sure to make conditions worse rather than better. The first and most important thing to do is to secure honest and efficient government and this cannot be accomplished until the general standard of honesty has greatly improved, which is simply another way of saying that there is no substitute for character of the individual members which make up a nation.

Finally, devise means and methods whereby remuneration and reward shall be in direct proportion to time and energy legitimately expended and to the value of services rendered to society.

While the underlying purpose of Social Insurance is to secure the more equable distribution of wealth and to employ the weapon of taxation in order to secure the necessities and comforts of life to the poor at the expense of those with larger incomes, the system is of necessity a failure because it does not conform with the foregoing fundamental principle of justice, but instead, rewards the inefficient at the expense of the efficient; the lazy, shiftless and immoral at the expense of the industrious, thrifty and moral. While it is unquestionably true that certain individuals have been and are still receiving money for which they have not rendered an equivalent service to society, trebling and quadrupling and even ten-fold the number of these parasites does not correct the evil. The remedy must be much more fundamental.

This formula will require the best brains of the country for its practical application, but I am firmly convinced that it is the only formula that offers a practical solution to our social and economic ills not only of the allied professions but of society in general. If it is followed those members of society who are doing the world's work will have enough money to employ capable dentists and physicians of their own choice and will then be assured adequate health service.

TILTON FOUND GUILTY

Lester Tilton, notorious and aggressive promoter of a nostrum for cancer, was found guilty of conspiracy to violate the medical practice act of the state of Illinois. Similar verdicts were also brought by the jury against two co-defendants who aided Tilton in his quackery, Harry de Joannis, a promoter, and Joseph Duffy, a licensed physician. Tilton's activities have long been a stench and a disgrace to the middle west. Tilton's "cancer cure," like practically every other humbug of the type, is an escharotic with zinc salt as the active ingredient in a base of peat as the "mystery" element. (Jour. A. M. A., July 2, 1932, p. 38.)

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

There are many physician economists who believe that America will not emerge from this depression without the inauguration of some system of health insurance or some form of social medicine comparable to the systems that have been tried with varying success in European countries.

It is of tremendous significance and importance to the doctor and the layman, too, that the American Medical Association should be alert to the tendencies of the times and prepared to take an authoritative position on behalf of the medical profession. In witness of that readiness, an important study by R. G. Leland is now ready for early publication in the Bulletin of the American Medical Association. Dr. Leland is Chairman of the Medical Economics Committee of the American Medical Association. His paper is a résumé of all essential points, together with criticisms of all existing schemes for furnishing medical treatment to the poor, to special classes, to industry either free or upon the installment basis.

This paper will be of tremendous interest to every physician in every county society and state association in the country where experiments are being tried or are in contemplation for the solution of some of the baffling current problems of medicine. It is, in no sense, a sweeping condemnation of such experiments, as deplorable departures from the traditions of medicine. On the contrary it is a grave consideration of all of them to discover what is good in them as well as what is bad.

It definitely foreshadows constructive action on the part of organized medicine itself, instead of on the part of insurance companies, or government bureaus looking toward adjustments which shall not sacrifice the essentials of freedom from lay interference.

Following is a part of Dr. Leland's conclusion which, together with the entire paper, should have the serious attention of every society and every physician.

EFFECTS OF GENERAL ECONOMIC DEPRESSION ON THE MEDICAL PROFESSION

"It is impossible to determine the extent to which the incomes of physicians have fallen to or below the commonly accepted amount necessary for the American standard of living. Sufficient evidence is available to show that not only have incomes dropped to an unprecedented low point but the financial insecurity caused thereby has apparently also resulted in a sort of mental panic and physicians appear to be willing to embrace almost any scheme which holds out promises of a more definite financial return.

The following statements, therefore, seem justifiable, if not self-evident:

"1. Large numbers of physicians are now receiving bare subsistence incomes.

"2. Stress of financial worries operates to distort clear thinking and careful planning on plans for medical care.

"3. Immediate financial relief to the medical profession in times of general economic depression is likely to be given more serious consideration than measures for ultimate sound adjustment.

"4. During periods of financial stress, opportunities frequently present themselves to disregard the principles of ethics and because of the exigencies of the moment to fall into undesirable and dangerous practices."

OF GENERAL INTEREST

At the October meeting of the Minnesota Academy of Ophthalmology and Otolaryngology, Dr. Harold J. Rothschild, St. Paul, was elected president.

The new Bethesda Hospital, St. Paul, was dedicated with fitting ceremonies Sunday, October 2. The hospital was erected at a cost of $500,000 by the Augustana Lutheran Church organization of Minnesota.

The marriage of Dr. F. J. Plondke and Miss Madeline May Bruchman took place Thursday, September 28, 1932, in St. Paul's Evangelical Church, St. Paul. Dr. and Mrs. Plondke are at home at 976 Summit Avenue, St. Paul.

Dr. Ragnar T. Westman, Chief of the Quarantine Division of the Minneapolis Department of Health, was married, October 4, 1932, in Minneapolis, to Miss Gladys Emilie Magiera, R.N. Both are residents of Minneapolis. Dr. Westman is a graduate of the University of Minnesota School of Medicine, and Miss Magiera is a graduate of the St. Andrews and University of Minnesota Schools of Nursing.

The title of Commendatore della Corona d'Italia (Knight Commander of the Crown of Italy) was conferred on Dr. William J. Mayo and Dr. Charles H. Mayo by His Majesty, the King of Italy, in recognition of their services to science and to humanity, and more especially in recognition of their kindness to Italian graduate students, studying at the Clinic, and to patients of Italian origin who are cared for in the Clinic. His majesty was represented by the Acting Royal Italian Consul, Cavaliere A. Castigliano. The ceremony was held in Plummer Hall, Saturday morning, October 22, at 11:00 o'clock. The professional and nonprofessional members of the staff and many other citizens attended the ceremony.

An unusually successful and valuable Short Course in Tuberculosis was held at the Southwestern Minnesota Sanatorium at Worthington, Friday, October 14, under the auspices of the Minnesota Public Health Association. Enrollment for the course, limited as always to twenty-five, was complete.

The morning program was devoted to papers by visiting clinicians: "New Development in the Diagnosis and Treatment of Tuberculosis," by J. A. Myers, Minneapolis; "Childhood Tuberculosis," by C. A. Stewart, Minneapolis; "X-ray Diagnosis of Pulmonary Diseases," by Leo Rigler, Minneapolis; "Differential Diagnosis and Treatment," by H. G. Wood, Rochester; "History and Symptoms," by S. A. Slater, Worthington; "Conditions Simulating Tuberculosis," by W. P. Ross, Worthington, and "Why Tuberculosis Short Courses," by E. A. Meyerding, St. Paul.

In the afternoon attending physicians were divided into small groups for examination of patients and consultation with the visitors.

In a report made before the American College of Surgeons in St. Louis, October 16, the following Minnesota hospitals were listed as approved by the College:

Minneapolis—Abbott, Asbury, Eitel, Fairview, Hill Crest Surgical, Lutheran Deaconess, Maternity, Minneapolis General, Northwestern, St. Andrew's, St. Barnabas, St. Mary's, Shriners' Hospital for Crippled Children, Swedish, University and U. S. Veterans'.

Saint Paul—Ancker, Bethesda, Charles T. Miller, Children's, Gillette, Midway, Mounds Park, Northern Pacific, St. John's, St. Joseph's, and St. Luke's.

Outside the Twin Cities—Naeve, Albert Lea; Douglas, Alexandria; St. Joseph's, Brainerd; Bethesda and St. Vincent's, Crookston; St. Luke's and St. Mary's, Duluth; More, Eveleth; George B. Wright Memorial and St. Luke's, Fergus Falls; Western Minnesota, Graceville; Adams and Rood, Hibbing; St. Gabriel's, Little Falls; Immanuel and St. Joseph's, Mankato; Nopeming Sanatorium, Nopeming; Glen Lake Sanatorium, Oak Terrace; St. John's, Red Wing; Colonial, Kahler, St. Mary's, and Worrell, Rochester; St. Cloud and Veterans', St. Cloud; Lakeview Memorial, Stillwater; St. Luke's, Thief River Falls; Warren, Warren; Willmar, Willmar; Winona General, Winona.

At a recent meeting in Chicago, the directors of Alpha Omega Alpha Honorary Medical Scholarship Society adopted the following resolutions in recognition of the eminent services of the late Dr. William W. Root, Slaterville Springs, New York, the founder of the society and secretary-treasurer since its organization in 1902:

1. That all stationery and official documents of the society bear the words, "Founded by William W. Root, 1902," and
2. That the annual lecture presented each year by a leading medical scientist be known as the "William W. Root Alpha Omega Alpha Lecture."

The present officers of the society are Walter L. Bierring, Des Moines, president; Austin A. Hayden, Chicago, vice president; Josiah J. Moore, 55 E. Washington Street, Chicago, secretary-treasurer. Mrs. Root will continue as assistant secretary.

In addition to the officers, the directorate includes Ray Lyman Wilbur, Washington, D. C.: Waller S. Leathers, Nashville; Louis B. Wilson, Rochester, Minn., and Willard C. Rappleye, New York City.

The committee on extension and policy comprises Elias P. Lyon, Minneapolis, chairman; William Pepper, Philadelphia; Irving S. Cutter, Chicago; Frederick C. Waite, Cleveland, and Thomas C. Routley, Toronto.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MASSEUR AND EX-NATUROPATH PLEADS GUILTY

State of Minnesota *vs.* Samuel C. Hoen

On September 19, 1932, Samuel C. Hoen, 278 Rondo St., St. Paul, Minnesota, entered a plea of guilty to practicing medicine without a license, before the Honorable John W. Boerner, Judge of the District Court for Ramsey County.

Hoen, a licensed masseur, had been treating one, Mrs. Hattie Shaughnessy, for cancer of the breast. The case was diagnosed by the defendant looking into the eyes of the patient; the ailment treated by the so-called galvanic current plus constipation pills. As a result of three months of treatment at the hands of this "grand old man," Mrs. Shaughnessy submitted to surgery.

In spite of a very eloquent plea by the pastor of the church attended by the defendant, for leniency, Judge Boerner, in no uncertain terms, denounced such treatment on the part of the defendant and sentenced him to one year in the St. Paul workhouse; ordered him to return the money obtained within thirty days and in addition thereto the defendant surrendered his massage license.

Hoen is listed in the 1925 city directory as a chiropractor and in the 1928 city directory as a naturopath. Hoen will be on probation for the next twelve months and will have no license whatever to practice healing in the future.

ITINERANT PREACHER PLEADS GUILTY TO GRAND LARCENY

State of Minnesota *vs.* Walter H. Hawkins

On September 23, 1932, Walter H. Hawkins, sixty years of age, entered a plea of guilty to grand larceny in the second degree, before the Honorable F. W. Senn, Judge of the District Court at Mantorville, Minn. Following an investigation made by the Minnesota State Board of Medical Examiners, Hawkins was arrested at Northfield, Minnesota, on August 24, 1932, after his receiving $125.00 in cash from Mrs. Catherine Sammon at Faribault, who has been ill for some time. Mrs. Sammon, seventy-seven years of age, was persuaded by Hawkins to part with this money on the representation by Hawkins that he would give her divine healing via the absent treatment route from Chicago each evening for a period of six weeks; that such a course of treatment would effect a cure for Mrs. Sammon's ailment. Hawkins did not return to Chicago and upon the expiration of the six weeks period with no improvement in Mrs. Sammon's condition, Hawkins was placed under arrest. At the time of entering his plea of guilty, Hawkins had been confined in the Rice County jail for a period of thirty days and was given a one-year suspended sentence in the county jail of Rice County. Hawkins informed the Court that he was leaving at once for his home in Chicago. Hawkins is a licensed dentist in the State of Illinois. Hawkins admitted to the Court that he had been convicted of practicing dentistry wihtout a license in Chicago, and that he had been tried and found not guilty at Springfield, Illinois, of practicing medicine without a license.

Judge Senn informed Hawkins in a very emphatic way that such practices would not be tolerated in this State and that any complaint against him in the future would be very severely dealt with.

This is the first prosecution against an alleged divine healer since the passage of the Basic Science Law and shows conclusively that, with proper coöperation by the county officials and the Court, quacks and swindlers will not be able to get by in this State because of their false claim of divine healing.

Very splendid coöperation was received in this case from Thomas H. Quinn, County Attorney of Rice County, and Sheriff Ernest W. Haverland and his office.

"DOCTOR" RECEIVES THIRD SUSPENDED SENTENCE

State of Minnesota *vs.* Dufort

J. E. Dufort, fifty-seven years of age, residing at Mizpah and formerly of Northome, entered a plea of guilty to an information charging him with practicing healing without a Basic Science Certificate, on October 4, 1932, before the Hon. Alfred E. Thwing, Judge of the District Court at International Falls. Judge Thwing sentenced Dufort to one year in the county jail and suspended the sentence until the May, 1933, term of Court in that county.

Dufort has two previous convictions for practicing in violation of the Basic Science Law, both of which resulted in one-year county jail sentences which were also suspended on the promises of the defendant to refrain from practicing. The first sentence was imposed December 22, 1928, by Judge Wright at Park Rapids; the second, October 8, 1930, by Judge Wright at International Falls.

In view of the importance of the case and the fact that it is the first time in the five years the Basic Science Law has been in effect that three suspended sentences have been given the same person, there is published herewith the transcript of the proceedings at the time Dufort was sentenced by Judge Thwing. Following Dufort's second conviction, a licensed physician located at Northome to serve the people in that vicinity. This doctor still resides there.

The State Board of Medical Examiners conducted the investigation of the three cases against Dufort and they intend to fulfill their duty under the law in the future. Complaints will be filed against those who practice without the necessary credentials whether it be Dufort or some other person.

The Board acknowledges the splendid coöperation of the office of Mr. J. J. Hadler, county attorney for Koochiching County, Mr. L. P. Blomholm, attorney at law, International Falls, who acted for the County in the absence from the city of Mr. Hadler, and Miss Mary Hobbins of the county attorney's office.

State of Minnesota, In District Court
County of Koochiching. Fifteenth Judicial District
State of Minnesota, *Plaintiff,*
vs.
J. E. Dufort, *Defendant.*

The above entitled matter came before the court, Hon. Alfred E. Thwing, judge presiding, at the courthouse in said county and state on this 4th day of October, 1932, Mr. L. P. Blomholm appearing for the county attorney, Mr. J. J. Hadler, and the defendant appearing without counsel, and duly entered a plea of guilty, whereupon the following remarks by counsel and the court were made, and sentence and judgment made:

Court: Is there anything further counsel desire to say for the purpose of the record?

Mr. Blomholm: I have nothing to say in behalf of the county attorney.

Mr. Brist: In view of the frankness with which this case has been discussed on the part of every one, if it is proper I would like to have the record show that I appear for the Minnesota State Board of Medical Examiners; that on two previous occasions I investigated the activities of the defendant, both of which investigations resulted in prosecutions and that both prosecutions resulted in pleas of guilty by the defendant being entered, and that the defendant has twice been placed on probation by this court. And I appreciate thoroughly as a lawyer, and I have so previously advised my client, that the matter of penalty is not a matter for the board and it isn't a matter for the attorney for that board. I do feel, however, in view of the repeated promises made by the defendant to this court, which promises he has not kept, and the fact that he has returned to the scene of his former activities, after having the terms of his previous sentence explained to him thoroughly by Judge Wright, that it would seem that the defendant, knowingly, wilfully violated this law. I had some talk with the defandant last Friday, and he admitted to me in the presence of a third party that since returning to Mizpah he has made his living in this manner; that he has taken care of people medically and that he has been paid a fee, and that he has paid his rent—he says he is obligated to pay $10 a month rent down there—and while he hasn't made very much money, he has been very candid in stating that the money he did get he got from treating people for physical ailments—there is no question about it not being right. In view of the facts and all the circumstances surrounding this particular case, it is my own personal opinion, and I am sure I am reflecting the attitude of the Medical Board when I state it doesn't occur to me the defendant is entitled to a great deal of leniency. I realize he has been in that community for a long while. He undoubtedly has done a great deal of good. I don't think that is open to question. But if we are going to enforce the medical practice act and basic science law of the State of Minnesota, I feel we have to do it with some degree of equity to all defendants, and it seems to me by this time, at his age, of 57, he should realize that that is the law of the state and he cannot practice unless he is properly licensed.

The Court: What is your disposition, Mr. Dufort, as to continuing practicing?

Mr. Dufort: Well, your Honor, as Mr. Brist says, I have been released before, and I have broken it, but at the same time I realize it is no use for me to try it again. So far as practicing is concerned, I realize I have to quit, if I don't quit willingly.

Court: Do you propose to quit?

Mr. Dufort: I propose to quit and propose to leave Mizpah.

Court: Are you sincere in that statement?

Mr. Dufort: I am sincere.

Mr. Blomholm: What do you propose to do.

Mr. Dufort: I have a proposition to go help a friend of mine; he has got a store and postoffice.

Mr. Blomholm: What is his name?

Mr. Dufort: Joseph Locher.

Mr. Blomholm: Where is that?

Mr. Dufort: Popple postoffice; it is about 30 miles from Northome.

Mr. Blomholm: You intend to work there in that store?

Mr. Dufort: Yes.

Mr. Blomholm: Have you been promised a position in that store?

Mr. Dufort: Yes, sir.

Court: This is one of the unpleasant responsibilities the court has to take, peculiarly so, difficult and unpleasant in this case because I have known the defendant myself, for a number of years, not well, but I have known him, and his reputation and standing in the community in which he lives. I am inclined to think that the fact that he has that reputation on behalf of the people is, in part perhaps, largely responsible for the difficulty he has met in endeavoring to fulfill his promises in the past. I am glad one of the counsel for the state has conceded that the defendant has done a great deal of good in his community. I thoroughly believe that is true. Nevertheless, the law is here, and the officials and the court are charged with the responsibility of enforcing them. We have no discretion in saying whether that should be the law or not, or whether it should be enforced. I am going to be lenient in this case in opposition to the recommendations of the attorney for the state, in opposition to the recommendations that I believe to be sincere and disinterested from the medical board; and, perhaps, I should be open to criticism for doing so, nevertheless, the responsibility is mine. I know you appreciate, Dr. Dufort, that notwithstanding the good you have done in the past, the law is here for a good purpose, to prevent people assuming to practice who don't do good, who do harm and mislead the public, and in order to carry out the purposes of it, there can't be discrimination in its enforcement. It isn't proper for the representative of the state and it isn't proper for the court to say in one case the law shall be enforced and in another case that it should not. I hope that you will appreciate in the future the difficulty and embarrassment affecting the county to place you in court if you fail to comply with the conditions of the suspension. There must be a limit, of course, to the discretion we have as to whether those conditions will be insisted upon, and I doubt exceedingly whether circumstances in the future will justify my foregoing the responsibilities involved and insist upon those conditions being complied with. I understand you and your friends propose to make an effort in the legislature to obtain relief. If such relief is granted that will solve this particular case. If it isn't, I hope that in the interests of good government and respect for the law generally you and your friends and my friends down there in that locality will abide by the result and refrain from putting the authorities in the impossible position of shutting our eyes to the matter whether any law should be enforced.

It is the judgment and sentence of this court that you, J. E. Dufort, as punishment for the crime of practicing healing without a valid existing certificate of registration in the basic sciences, as required by law, of which you have been duly convicted on your plea of guilty, be imprisoned in the county jail of Koochiching County, Minnesota, for the period of one year. Provided, however, the execution and operation of this sentence shall be and are suspended to the first day of May, 1933, general term of this court, on condition that in the meantime you be and remain of good behavior; that you refrain absolutely from further violation of this or any other law, from holding yourself out, inviting consultation or other conduct in violation of law; and that you report to the county attorney of this county from time to time as he may direct as to your compliance with these conditions.

It is further ordered you be and are placed under probation under the supervision of Claude Fish and Joseph Locher, Jr., of Itasca County, if they shall accept such supervision, and serve without pay, and that each of them is hereby directed to cooperate with the court and the officials in seeing to it the conditions of the suspension of this sentence are fulfilled. That is all.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The programs for the month of November will be as follows:

November 2—Aids in the Diagnosis of Heart Disease.
November 9—Psittacosis.
November 16—The Child's Education in Health Matters.
November 23—Disease Carriers.
November 30—Tumors of the Salivary Glands.

THE AMERICAN COLLEGE OF PHYSICIANS

Announcement has been made that the American College of Physicians will hold its Seventeenth Annual Clinical Session at Montreal, with headquarters at the Windsor Hotel, February 6-10, 1933.

Dr. Francis M. Pottenger of Monrovia, Calif., as President of the College, has charge of the program of General Sessions. Dr. Jonathan C. Meakins, Professor of Medicine and Director of the Department, McGill University Faculty of Medicine, is General Chairman of local arrangements and in charge of the program of Clinics. Mr. E. R. Loveland, Executive Secretary, 133-135 S. 36th Street, Philadelphia, Pa., is in charge of general business arrangements, and may be addressed concerning any feature of the forthcoming session, including copies of the program.

PARK REGION DISTRICT SOCIETY

W. S. Broker, Battle Lake, has been elected president of the Park Region District and County Medical Society. J. B. Vail, Hennin, and W. I. Nelson, Underwood, are vice president and secretary-treasurer, respectively.

RICE COUNTY SOCIETY

The Rice County Medical Society held its first fall meeting at the Faribault Clinic rooms, September 22. Dr. Thomas Meyers, Saint Paul, talked on "Simplified Infant Feeding," and Dr. G. Dunne, Saint Paul, gave a talk, illustrated by moving pictures, on "Obstetrics."

ST. LOUIS COUNTY SOCIETY

Carl A. Scherer, Duluth, was elected president of the St. Louis County Medical Society at the society's annual meeting October 13. Other Duluth physicians elected to office for the next year are: W. J. Ryan, first vice president; R. L. Burns, second vice president; M. McC. Fisher, secretary-treasurer. The new board of censors will be W. G. Strobel, L. L. Merriman, E. E. Webber.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Southern Minnesota Medical Association held at Rochester, September 12, the following officers were elected: Dr. Rasmus V. Williams, Rushford, president; Dr. Harold C. Habein, Rochester, and Dr. Walter H. Valentine, Tracy, vice presidents; Dr. Monte C. Piper, Rochester, secretary (re-elected).

SOUTHWESTERN MINNESOTA MEDICAL ASSOCIATION

At a meeting of the Southwestern Minnesota Medical Association held in Lakefield, October 3, the following were elected to office for the ensuing year: President, Dr. J. T. Rose, Lakefield, vice president, Dr. H. DeBour, Edgerton; secretary-treasurer, Dr. E. G. McKeown, Pipestone.

WASHINGTON COUNTY SOCIETY

E. J. Engberg, St. Paul, secretary of the Minnesota State Board of Medical Examiners, addressed members of the Washington County Medical Society at Stillwater on difficulties of law enforcement against medical law breakers at the first meeting of the society following the summer recess. F. J. Savage, Saint Paul, Councilor for the Fifth District of the Minnesota State Medical Association, also spoke.

The October meeting of the society was devoted to Child Behavior Problems, with J. E. Anderson, Minneapolis, of the Institute of Child Welfare, University of Minnesota, as principal speaker.

COMMITTEE ON STATE HEALTH RELATIONS

In the January, 1932, number of MINNESOTA MEDICINE, this committee published extracts from the Minnesota Laws governing medical care of the poor. The following series of questions and answers was drawn up by a committee of the Kandiyohi-Swift County Medical Society, and is published in the hope that it will further clarify our understanding of the present status of the subject in Minnesota. Further information is to be published later. Questions regarding medical care of the poor are invited; some of these will be published from time to time as space permits.

1. Who is a pauper in Minnesota?

   A pauper is one who is in need of *any* or all of the commonly recognized necessities of life, such as food, shelter, clothing, medical or surgical attention, etc., and who is unable to provide the same for himself.

2. Who are the blood relatives, in order, that should support a pauper?

   Children, parents, brothers and sisters, grandchildren or grandparents, except in those unable to earn a livelihood by reason of intemperance or bad conduct, in which case the obligation extends no further than parent and child.

3. Do the words "pauper" and "poor" have practically the same meaning?

   Yes, according to various definitions and court decisions.

4. How are the poor cared for in Minnesota from a medical standpoint?

   By relatives or by duly constituted authorities.

5. Who are the duly constituted authorities?

   They are of two types.

6. What are the two types?

   The County System and Town System. Under the former the County Board, under the latter the Town Board, City or Village Council, are the constituted authorities.

7. May a county be under both systems at one time?

   No.

8. What system have cities and villages?

   Depends on whether the county in which located has County System or Town System.

9. Who determines who is a pauper?

   It is solely within the judgment of the county or town, village or city authorities.

10. If the proper relative under the law refuses to give aid, is the county or town responsible?

    Yes.

10*a*. If a pauper's relative who is financially able and is liable, refuses to do so, may town or county pay the bill and collect from such relative?

Yes.

11. Are there two kinds of care?

    Yes, permanent and temporary.

12. What is the County System?

    The County Board of Commissioners have a poor fund which they administer for the benefit of the county as a whole.

13. Does the County Board have the right to appoint a County Physician?

    Yes.

14. May the County Board appoint more than one doctor or all doctors of the county as County Physician?

    Yes. (Section 3048 G. S. 1913.)

15. May a county pay for a pauper who has a legal residence in another county?

    The chairman of the County Board must warn the pauper to depart and if he refuses, or fails to do so within a reasonable length of time, and is likely to become a public charge, he may be ordered conveyed. If he is so sick or infirm as to make it inhuman to remove him he may be given immediate necessary care and the same will be a charge against the other county.

16. Which officer under the County System has the care of the poor?

    Each County Commissioner has jurisdiction over the poor in the district from which he is elected.

17. Under what system are the counties of Kandiyohi and Swift?

    The Township System.

18. What is the Township System?

    In this Township System the Town Board is specifically charged with the care of the poor, as one of its duties, within its confines.

19. Is it binding on the Town Board to give care?

    Yes, to any pauper.

20. Who is the proper officer to notify?

    The chairman of the Town Board.

21. May the Town Clerk be notified or give consent?

    No, he is not a member of the Town Board but acts as its clerk.

22. May any member give authorization for treatment?

    If he gives consent it is usually considered binding on the Board.

23. How may notification be given?

    Either written or verbal.

24. If written, is there a legal form?

    No, a simple statement of the condition and care necessary is all that is needed.

25. Is a written form of notification all that is necessary to hold a town or county liable?

    No, the care must then be authorized by the proper authority.

26. If verbal authorization is given either personally or by telephone, what should be done?

    The doctor should at once write a letter to the proper authorities confirming such verbal consent and keep copy of letter for his own file. It might be necessary later on to prove such authorization.

27. Who is the proper one to notify to get consent from in villages or cities?

    The president of the village or mayor of the city unless they have a special constituted officer for such purposes.

28. May a town have a regularly appointed physician?

    Yes.

29. Can the town force a pauper to use such physician?

    Yes, if the town is to pay for such care.

30. Do towns have poor funds?

    Yes.

31. If such fund is used up, what may be done?

    The fund is replenished from other township funds.

32. If there are no such funds available, is the county or town still liable?

    Absolutely.

33. When do counties help pay under the Township System?

    When the amount expended is in excess of one mill on the taxable value of property of that town or village or city the county is liable to such town, village or city for 75 per cent of such excess.

34. How may officers be forced to provide care?
 If the county or town fails to provide care, the members may be sued for malfeasance or nonfeasance of office.
35. How is place of residence in county determined?
 If a person has resided in the county for one year he has a legal residence established in that county.
36. How is place of residence in town established?
 It shall be that township wherein he has resided longest in that year.
37. When a dispute arises between towns, how is it decided?
 By application to a justice of peace of a town not involved in the dispute or in certain cases by the State Board of Control.
38. Can the town or county return a person to the legal place of settlement?
 Yes, providing his or her condition is such that they may be taken without danger to the life of the individual.
39. May any doctor render first aid or emergency treatment without notice and authorization and hold the proper authorities responsible?
 Yes, absolutely. It is a well established fact that emergency treatment must be paid for by the county or town without authorization.
40. What should be done after emergency treatment is given?
 Notice to proper authority must be given at once after emergency treatment has been given and authorization obtained for further care and treatment.
41. May the county or town authorize its own doctor to take over and care for such case after first aid has been rendered by another doctor?
 Yes.
42. May one town pay a bill and recover from another if legal settlement of pauper is in the other town?
 Yes, if in immediate need and his condition is such that it would be inhuman to remove him. In which case notice should be given to County Auditor. In other cases the poor person should be conveyed to settlement. County Auditor should be notified within three days.
43. May the proper authorities pay for obstetrical cases?
 Yes, if notice has been given and authorization allowed.
44. When may obstetrical cases be considered an emergency?
 When the doctor has never seen a case and is called to come at once and delivery takes place so quickly that to call or give notice is impossible, it may be considered as an emergency and bill paid by proper authority.
45. Is an operation quickly done as a matter of life and death an emergency?
 It may be so considered, yet you are on surer ground to give notice and receive permission.
46. When are the proper authorities responsible outside of emergency cases and when notice has been given?
 If a doctor has a pauper in need of care and gives notice to the proper authority and that authority does nothing to provide such proper care, then the doctor may continue that care and hold the proper authority responsible for that bill. This is an important exception.
47. If a person has no legal residence in state, who is responsible?
 If under the County System, the county is; if under the Town System, the town wherein that man is found when such relief is needed.
48. May the county pay hospital care for a patient that county is under the Township System and the medical care is given free, instead of sending him to the University General Hospital?
 No. Unfortunately he must be sent to the University if the county is to pay.
49. If treatment is authorized by the proper authority and then it is discovered that man is not a pauper, is the town or county still liable?
 No.
50. May the money for medical care be paid to a pauper to be transmitted to the doctor?
 No. The money must be paid from the Board to the doctor.
51. May a county or town provide poorhouses?
 Yes.
52. How may a county change from one system to the other?
 By a vote of the Board to submit the question to the voters of the county or by a petition of a certain percentage of the voters.
53. Which system seems to be the most satisfactory?
 The County System.
54. How are the counties working out their problems with doctors?
 In several ways as shown below:
 1. By appointment of one or more doctors, at a stated amount per year.
 2. By contracts with hospital or hospitals in county for a specified amount or at a reasonable rate per day.
 3. By the appointment of all doctors who will do authorized work for a stated fee or a percentage of the regular fee schedule.
55. May towns use the same system?
 Yes.
56. What are certain counties in Iowa doing?
 The doctors belonging to a county medical society sign a contract with the county as individuals to do all authorized county work for a definite sum for the year. In counties of about 24,000 people this sum is around $3,000 per year. This sum is paid to the treasurer of the medical society, who pays members' dues to state and national societies, malpractice insurance on each, and incidentals of running the society, then the rest is used to carry on a public health program of many varieties or is pro-rated back to the members in proportion to the amount of such work in the care of the poor as each has done during the year and reported.
57. May a corporation practice medicine?
 There are many court decisions that a corporation cannot practice medicine.

Respectfully submitted,

Committee on Care of the Poor
A. F. Branton, M.D., Willmar, Minn.
Oscar Daignault, M.D., Benson, Minn.
Fred Behmler, M.D., Appleton, Minn.

AMPOULES SODIUM CACODYLATE, FOR INTRAVENOUS USE (P. D. & CO.) OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that these were accepted (although the Council believes that the intravenous administration of sodium cacodylate is unnecessary and undesirable) because Parke, Davis & Co. made no propaganda for the use of this method of administering sodium cacodylate, but merely supplied these ampules to meet a demand. The Council has become convinced that the inclusion of sodium cacodylate ampules definitely proposed for intravenous use is likely to be taken to mean that in the opinion of the Council the intravenous use of sodium cacodylate is rational. Therefore, the Council has omitted these ampules, even though the firm is making no claims which invite such use. (Jour. A. M. A., May 7, 1932, p. 1654.)

PROGRESS SECTION

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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EYE, EAR, NOSE AND THROAT

THE HYALOID MEMBRANE OF THE VITREOUS: Alfred Cowan, M.D., and W. E. Fry, M.D., Philadelphia (Trans. Amer. Acad. Ophthal. and Otolaryng., 1931, p. 159).

In a former paper by one of the authors, slit lamp studies following intracapsular lens extraction for cataract revealed the presence of a membrane just posterior to the iris and separating the vitreous from the aqueous. The anatomical and histological evidence of such a membrane was obtained by examining animal and human eyes after hardening in formalin and alcohol and stripping the eye of all parts except such a membrane. The latter was found attached to the pars plana of the ciliary body.

The membrane was further sectioned and stained with a large number of different stains, the best of which proved to be Verhoeff's elastic tissue stain. This produced the deep blue uniform stain of a membrane, distinct from the posterior lens capsule and anterior edge of vitreous. Numerous trabeculæ or fibres extended from the posterior surface of this membrane through a clear zone and into the vitreous body.

From their studies, the authors believe that there is a non-nuclear, structureless, uniformly staining membrane separating aqueous from vitreous, and which they designate as the anterior hyaloid membrane of the vitreous.

Frank W. Stevenson, M.D.

A SYMPOSIUM ON THE NERVUS ACUSTICUS (LARYNGOSCOPE, Vol. XLII, No. 6, June, 1932). The Applied Anatomy of the Eighth Nerve and its Environs, the Cerebello-pontile Angle, C. B. Courville; Pathological Conditions Involving the Eighth Nerve and the Cerebello-pontile Angle, N. Evans and C. B. Courville; The Pathological Anatomy of its Neoplasms, L. J. Adelstein; Histopathology of the Eighth Nerve, E. M. Hall; Symptomatology from the Standpoint of Neurosurgery, S. D. Ingham; Vestibular Symptomatology, E. R. Lewis; Eighth Nerve Symptomatology from the Standpoint of Neurosurgery, C. W. Rand (Laryngoscope, Vol. XIII, No. 6, June, 1932). The details of structure of the Nervus Acusticus vary considerably in the different vertebrata, but its general position and relationships are remarkably constant. The difference in the extent of the glial portion of its two divisions is to be explained on an embryological basis and may account for the tumors of the eighth nerve. The soft texture of its central portion and the crossing of its constituent fibers account for its frequent damage in cranio-cerebral injuries, and for its susceptibility to injury and distortion by local new growths.

Lesions of the intracranial portions of the Nervus Acusticus are now recognized to be fairly common. Delayed or missed diagnoses in such cases can usually be attributed to failure to consider all the possibilities. A general classification of the lesions is as follows:

I. Traumatic—The petrous portion of the temporal bone is often involved in fractures of the base of the skull. Complete laceration of the eighth nerve is not uncommonly seen in cases coming to autopsy. One may reasonably assume that patients who survive a basal skull fracture may have some degree of pathological change in the eighth nerve. Furthermore, studies on the histological changes in the brain following head injury have shown small petechial hemorrhages in the central nuclei of the acoustic and vestibular nerves. The nerve cells composing these ganglia, under higher magnification, show vacuoles in their nuclei and cytoplasm indicating possible damage to the ganglia as well as to the rest of the brain (edema). More or less permanent injury may result from these changes.

II. Vascular—In addition to hemorrhage produced by trauma other vascular lesions are to be thought of. Thrombosis of local vessels is not accompanied by eighth nerve symptoms unless the vertigo is due to disturbance of the terminal nuclei. Aneurysms of the upper portion of the vertebral artery have given symptoms typical of cerebello-pontile angle lesions.

III. Infectious—Infectious meningitis, chronic arachnoiditis with the formation of occlusion cysts, and subacute or chronic infections involving the pons and middle cerebellar peduncle.

IV. New Growths Occupying the Cerebellar-pontile Angle—These may arise from practically every regional tissue or structure. A classification of new growths occupying this region is as follows:

A. Primary—Neurinoma, meningioma, cholesteatoma, and adjacent brain structure tumors. Papilloma of the choroid plexus and glioma of the pons. Tumors arising from the petrous portion of the temporal bone.

B. Secondary and metastatic tumors.

C. Cysts of the cerebello-pontile angle.

D. Infectious granulomas: 1. Tuberculosis, 2. Gumma.

Tumors of the Nervus Acusticus account for approximately ten per cent of all brain tumors. They are the most amenable to surgical interference of all intracranial tumors. These tumors are round in shape and as they enlarge tend to conform to the shape of the tentorium above, the pyramidal bone laterally, the base of the posterior fossa below and medially, to crowd the cerebellum, brain stem and cranial nerves. That eighth nerve tumors are not only extra-cerebellar and subdural but are contained within an arachnoid capsule, has never been fully appreciated.

The cranial nerves from the fifth to the twelfth are are in close proximity to one another in the angle, and naturally a growth arising from the eighth nerve will in turn involve the major portion of this large group, particularly the fifth and seventh, the others usually to a lesser degree.

Vestibular service, like all physiologic services, is without "symptoms" under normal conditions. Disturbance of its working conditions results in qualitative and quantitative responses which include vertigo, nystagmus, falling, past pointing, pallor, sweat, nausea, vomiting, and faintness. Analysis of abnormal reactions often reveals the location of a lesion as definitely peripheral, subtentorial, or supratentorial.

The accepted surgical approach of these tumors is by cerebellar exploration. The matter of partial or complete removal of the tumor depends on conditions found at operation. Even with incomplete removal of the tumor, the patient in the majority of cases will have marked improvement over a period of years, and if necessary a second operation can be carried out. With the abundant evidence elicited by neurological, neuro-otological, and roentgenological studies, lumbar punctures are unnecessary. There is the danger from the effect of lumbar puncture of herniation into the foramen magnum.

Lawrence R. Boies, M.D.

MEDICINE

NEUROLOGIC ASPECTS OF PRIMARY ANEMIA: Richard S. Ahrens, M.D., Minneapolis, Minn. (Arch. Neurol. and Psych., July, 1932). This is a study of 189 cases of proved pernicious anemia from the standpoint of the neurologist.

Involvement of the cranial nerves was not of any significance. Much was accidental or incidental. Twelve cases showed pupillary irregularity but there were no typical findings. Co-ordination was impaired, chiefly in the lower extremities, and they are usually more profoundly involved than the upper. Disturbances in gait are relatively common and must be regarded as an evidence of general weakness. Involvement of the sphincters is not found very often. One might expect it to occur more often, but it was usually found in cases where there was extreme cord invovement. The deep reflexes showed all variations, particularly in the lower extremities. The upper extremities are usually not involved except in cases of peripheral neuritis, when they may be increased or decreased. There is a tendency for a loss of the Achilles reflex. Paresthesias were noted in 133 instances. They usually occur in the fingers and toes and are of the "pins and needles" type. Paresthesias tend to disappear and reappear, often appear early in fingers, and rarely are associated with any changes in the reflexes. Impairment of vibratory sense in the upper extremities is relatively rare, and is of no diagnostic importance. Loss of the vibratory sense over the first toes is significant and occurred in 61 of the patients. When this is noted there is usually a rising curve towards normal as the lower extremities are ascended. Mental changes are common, and they vary from mild personality changes to a definite well organized delusional psychosis. Most common, however, are delayed cerebration, loss of memory, irritability, depressed states, and frequently euphoria is observed.

Ninety-seven per cent of the cases studied show some involvement of the cord. Only changes in the deep reflexes and loss of vibratory sense were considered. Paresthesias were not considered as an evidence of cord involvement.

The author also comments on the many optimistic reports of neurological improvement following liver treatment and believes that liver therapy has no effect on the neurologic findings. Mental changes frequently show marked improvement.

Richard Bardon.

SLEEP: ITS VALUE IN TUBERCULOSIS: N. Kleitman, Ph.D. (Jour. of the Outdoor Life, Feb., 1932, p. 89). Sleep is generally looked upon as the most complete form of rest and is therefore of paramount importance to the tuberculosis patient. The sleeping person takes no notice of events and does not respond to changes in his environment.

The position of the body in sleep is of relatively little importance, since no position is held for any great length of time. The average time between stirs as determined by actual tests is about 10 minutes and the longest about one hour. Since these movements are of very short duration the total time one spends in moving about probably does not exceed five minutes in a night. Sleep, then, may be looked upon as a period of almost complete muscular inactivity.

During sleep there is a decrease in activity of the heart, which leads to a lowering of the arterial blood pressure. These in turn decrease the danger of hemorrhage in disease. The absence of disturbing external influences also has a beneficial effect upon the circulation and respiration.

Sleep decreases the basal metabolism and tends to reduce the temperature. Muscular activity results in the production of large quantities of heat, which cannot be dissipated as fast as they are produced. This leads to a temporary rise in temperature. Through rest in bed and sleep one can hold the temperature at a lower level.

Practically all of the glands in the body secrete less during sleep than during the waking state. A notable exception is found in the sweat glands, a fact which is well known to the tuberculous. The cause of increased secretion of sweat in sleep probably represents an attempt of the body to get rid of an excess of heat accumulated because of insufficient ventilation of the space between the skin and the bed clothes and also of the bedroom.

There is decreased wear and tear of the living matter of the body during sleep and a consequent upbuilding, which is especially beneficial to the tuberculous. Under these conditions it is desirable to increase the duration of sleep as much as possible.

Everything tending to cut out sensation favors the onset of sleep. The newborn baby sleeps for eighteen to twenty-four hours a day, waking up every four or five hours because of hunger or discomfort, but such a baby is blind and deaf for the time being and experiences none of those sensations that may disturb an adult. Sound sleep is promoted by regular hours and regular habits. Worry, fear, anger or undue excitement may produce restless sleep because they interfere with relaxation. When one cannot sleep, it is well for the sufferer from insomnia to give up trying and to resign himself to lying awake. It should be noted that the decrease in muscular, circulatory, respiratory and metabolic activities occurring in sleep is largely due to rest in a horizontal position, and lying quietly awake, therefore, is nearly as good as sleep.—Reprinted from *Tuberculosis Abstracts*, Oct., 1932.

PEDIATRICS

STOVARSOL IN THE TREATMENT OF SYPHILIS IN INFANTS AND IN CHILDREN: Harold A. Rosenbaum, M.D., Chicago (Amer. Jour. Dis. of Children, July, 1932, No. 1, Volume 44). If the oral treatment for syphilis were as efficient or more efficient than the other modes of treatment, it would have many incidental advantages. Stovarsol administered by mouth has given such superior results that the author decided to test it in his clinic.

Stovarsol is an odorless, white tablet tasting like acetylsalicylic acid and is easily soluble in water or milk.

Alois Bratusch-Marrain system of dosage is as follows: For seven days, 0.005 gm. of stovarsol per kilogram of body weight is given daily; for seven days, 0.01 gm.; for seven days, 0.015 gm., and for forty-two days, 0.02 gm. A rest period of from four to six weeks follows this course of treatment. The aforementioned courses and rest periods are repeated until the serologic tests are negative and three times thereafter. Then a rest period of six months is given, followed by one more course. He thinks that the best dosage is from 0.01 to 0.02 gm. per kilogram of body weight, that smaller doses have no effect, and that larger doses offer no advantage.

It is interesting to note that Soldin and Lesser, comparing the mortality of patients under treatment with the old method from 1919 to 1924, with the mortality following treatment with stovarsol from 1924 to 1928, noted a much lower mortality with the latter.

In the older methods of treating syphilis, it always seemed advisable to use first one metal, and, as the tissues became resistant to the metal used, to employ another. In the author's experience the use of stovarsol has been so successful that this has not been done. It would seem, however, that if a resistant case should occur mercurial rubbings could be used alternately with stovarsol.

In forty-one cases of congenital syphilis in which treatment was given by mouth, stovarsol gave satisfactory results. In nine the treatment was begun during the first year and continued for a year or more; serologic reversal was obtained in all cases, and clinical results were excellent.

Of six patients who were more than one year of age when treatment was begun and in whom it was continued for a year or more, serologic tests became negative in only three, though clinical results in all of them were excellent.

The remaining cases were not reported as a group since the patients were not under treatment for a period of a year. Clinical improvement occurred in all patients. The serologic tests were reversed or influenced in most cases. Few reactions occurred.

R. N. Andrews, M.D.

MASSIVE INTRA-ABDOMINAL HEMORRHAGE IN THE NEW-BORN: Sydney Nussbaum, M.D., Brooklyn (Amer. Jour. Dis. of Children, July, 1932, No. 1, Volume 44). Exsanguination, due to massive intra-abdominal hemorrhage, was the direct cause of death in two cases. In the first case, death was the result of violent methods of resuscitation. The patient showed no effects from this condition for three days, when hemorrhagic tendencies in the new-born are likely. Recent investigations have demonstrated that in hemorrhagic disease of the new-born, laboratory tests are frequently negative, and that the main causative factor in this condition is the lack of, or poor quality of, the prothrombin enzymes, with resultant defective clot formation.

The best recommendation to prevent a recurrence of this situation, taught by this case, is to eliminate all forceful methods of resuscitation and the generalization of the use of the catheter cleansing of the throat, stimulation of the skin by cold and warm baths and occasional use of alpha lobeline. Both cases occurred on the fourth day of life, and were very likely associated with this hemorrhagic tendency.

In the second case, the hemorrhage came from the right suprarenal gland, where a large intrasuprarenal hemorrhage preceded the abdominal hemorrhage. Both patients died on the fourth day of life, when the greatest incidence of hemorrhagic disease of the new-born occurs. This was considered an important factor.

R. N. Andrews, M.D.

STOVARSOL IN THE PERORAL TREATMENT OF CONGENITAL SYPHILIS: Arthur F. Abt, M.D., and Alfred S. Traisman, M.D., Chicago, Illinois (Jour. Ped., August, 1932, Vol. I, No. 2). The arsenic content of stovarsol is approximately 27.1 to 27.4 per cent, while the content of neoarsphenamine is 19 per cent and that of sulpharsphenamine is 21 per cent.

The preparation which the authors employed was furnished to them by the manufacturers in the form of 0.1 gm. and 0.25 gm. tablets. Each 0.25 gm. (4 gr.) tablet contains approximately 0.068 gm. of arsenic, while the 0.1 gm. tablet contains approximately 0.027 gm. arsenic.

The individual course is of nine weeks' duration followed by a six weeks' rest period. The method of administration has been as follows:

In the small infants, the mother was advised to crush the amount of stovarsol ordered, to dissolve it in water and to give it one-half hour before feeding. When the dose ordered was large, in the older child, the instructions were that the medication be divided equally in 2 or 3 doses and be given with water, one-half hour before meals.

It is important that patients undergoing arsenical treatments should be under close observation during the course of the medication.

The first week, 0.005 gm. per kilo of body weight was administered daily. The second week, 0.010 gm. per kilo of body weight was administered daily; the third week, 0.015 gm. per kilo of body weight was administered daily; and the fourth week, 0.20 gm. per kilo of body weight was administered daily (the maximum dose). For the following five weeks the dosage was 0.02 gm. per kilo daily.

In the authors' series of 22 cases, the clinical symptoms improved rapidly. Cutaneous lesions cleared in one to three weeks. The improvement in the general condition of the children was impressive. The appetite increased and the gain in weight was marked, average gain being 4 pounds 4 ounces for the nine weeks' course of treatment.

The Wassermann reaction in their series of cases after treatment with one course of stovarsol became negative in 59 per cent of the cases. Most of the negative Wassermann reactions were obtained in infants under one year. The Kahn test became negative in 30 per cent of the cases.

No serious urinary changes were noted in this series, with the exception of one child, who had a severe arsenical dermatitis. The blood of younger infants showed marked secondary anemia; improved rapidly with the treatment. Eosinophilia was a frequent finding in their series of cases. The bone lesions healed rapidly after one course of treatment, both clinically and by X-ray.

The authors' results warrant the belief that the peroral administration of stovarsol is the method of choice in the treatment of congenital syphilis.

Parents should be warned that at the first sign of temperature, vomiting, diarrhea, or appearance of rash, the medication should be immediately discontinued.

The general physical condition of infants and children under this form of therapy improves rapidly, and the gain in weight is noteworthy.

R. N. Andrews, M.D.

NIRVANOL TREATMENT OF ACUTE CHOREA IN CHILDREN: Roger H. Dennett, M.D., and Samuel Wetchler, M.D., New York (Jour. Ped., August, 1932, Vol. I, No. 2). During the last two years, the authors have used the drug in seventy-two cases, and in every case the choreiform movements ceased within twenty days after beginning the treatment. Leaving out of consideration the permanency of the results, they are convinced that it is the best treatment yet devised for controlling the individual attack.

It is the authors' opinion that nirvanol is a specific for the individual attack of chorea. In all of their cases the attacks terminated favorably and rapidly, complications were absent and the heart and renal functions remained undisturbed. The effects obtained from nirvanol therapy are obviously not hypnotic in character, but due to a specific action, presumably on the corpus striatume in the midbrain, producing a definite reaction with changes in temperature, skin manifestations and characteristic blood changes.

The treatment is simple and available to all, since it consists only of the administration by mouth of a 5 grain tablet of nirvanol two or three times a day. The child is put to bed, kept on a simple diet, and, if under six years of age, given a tablet night and morning, while larger children, over this age, are given three tablets a day, until a rash or fever or both are induced by the drug. This usually occurs on the seventh or eighth day, when the drug is stopped and no further treatment is given. Drowsiness begins on the third day, when the child appears sleepy but rouses for food, urination, and defecation. Each day the drowsiness increases until in some instances the patient is almost stuporous and can be made to eat only with difficulty. As the drowsiness begins there is an exaggeration of the choreiform movements. Nirvanol should always be discontinued at the onset of the rash even if unaccompanied by fever. The drug, however, should never be given longer than twelve days, even in cases in which no reaction is noted, because indefinite administration of it may produce injury to the bone marrow and aleukemic blood changes. No patients with mild or fleeting choreiform movements were treated with nirvanol.

R. N. Andrews, M.D.

ROENTGENOLOGY

INTRAVENOUS UROGRAPHY: A NEW DIAGNOSTIC PROCEDURE FOR THE GENERAL PRACTITIONER: Miley B. Wesson, San Francisco (Urol. and Cutan. Review, 36:296, May, 1932). After reviewing the development and technic and limitations of the method, Wesson discusses the contraindications and the special indications for its use, and the interpretation of the findings. There are twenty-nine good illustrations. His conclusion is that "Intravenous urography has, in a way, restored a large field of medicine to the general practitioner, but he must realize that this agent is merely another diagnostic adjunct, and he must still depend upon the urologist for the final diagnosis."

Contraindications: Intravenous urography is dangerous in those with advanced renal insufficiency or general weakness—anuria, uremia, cardiac decompensation and advanced age. "Particularly prone to reactions are cases of idiosyncrasy to iodin, hyperthyrosis, pregnancy and active tuberculosis, thyrotoxicosis, acute and chronic renal disease."

Limitations: Chronic nephritis with poor diuresis or deficient concentration, and polycystic kidneys with little remaining parenchyma will give worthless pictures because of the delayed and diminished excretion. Cases of pyelonephritis, tuberculosis, and pyuria in infancy have been disappointing because of inhibited excretion due to purulent infection. The pictures are disappointing if not misleading in cases of renal tumors because of failure to show minor calyces and their minor deformities. A normal kidney may give a very poor or misleading picture if the exposure is made during systole when the pelvis or ureter is contracted. Moreover, inhibition of functional activity of a kidney may be either temporary or permanent, and mere nonvisualization at a particular examination does not necessarily means a permanently damaged kidney.

Special indications for intravenous urography include conditions which make a cystoscopy or ureteral catheterization impossible or dangerous—intolerance or deformities of the bladder, urethral stricture, some prostatic hypertrophies, some extensive bladder tumors, ectopic or rectally implanted ureters, and occluded or damaged ureters, as by stone, stricture or operative damage. It may give particularly good pictures in cases of hydronephrosis, congenital dilatation of ureter, and floating kidney. Intravenous urography should be a great help by giving a safe method of immediate diagnosis when rupture of kidney or bladder is suspected. It is suggested that it may be of value in differentiating between glomerular and tubular affections of the renal cortex—accentuation of the shadow of the renal cortex in the latter but not in the former. Intravenous urography is of particular value in cases of renal and ureteral lithiasis. In cases of "acute" ureteral stone there will be a good urogram on the unaffected side, and on the affected side an increased density of the kidney, but no outline or a very much delayed one of the pelvis and ureter. Cases of "chronic" ureteral stone which partially block the ureter show a well outlined renal pelvis due to stasis and some degree of hydronephrosis.

With all its advantages, however, intravenous urography is only one diagnostic procedure and often not one of precision; it does not replace retrograde cystoscopic examination though in some conditions it gives information not obtainable by the retrograde method.

Theodore H. Sweetser, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

RECEIVED FOR REVIEW

HOSPITALS AND CHILD HEALTH. A Publication of the White House Conference. 279 pages. Price, $2.50, cloth. New York: The Century Company, 1932.

HEART DISEASE. Paul Dudley White, M.D., 931 pages. Illus. Price $12.00. New York: The Macmillan Co., 1931.

There have been so many recent manuscripts concerning heart disease that it is difficult for anyone other than a cardiologist to keep abreast of the newer contributions. White is one of the few men capable of correlating the rapidly accumulating scientific knowledge with the clinical aspect of cardiology.

In this work, he attempts to present the newer methods of diagnoses and treatment. The work begins with a study of the history and symptoms of cardiac disease, as well as the examination of the heart and the rest of the organs. Throughout the book historical excerpts from original manuscripts are quoted. The laboratory and mechanical aids in diagnoses are reviewed with a particularly good résumé of cardiovascular roentgenology. The study of the electrocardiogram is possibly too detailed for general use but the plates are excellent and the description clear. The rest of the book consists of a review of the cardiac afflictions. The description is comprehensive and complete in a clear concise manner. The treatment, however, receives too little attention.

The entire book is well written and the bibliography is most complete. The binding is somewhat below the general quality of the paper and print.

JOHN FRANCIS BRIGGS.

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OBSERVATIONS ON ARTERIAL HYPERTENSION*

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MANY physicians like to quote words of wisdom from master minds in the art of healing. Some quote the ancients, some quote their own masters, some quote their contemporaries and many have even been known to quote themselves. I have many times quoted a master clinician, Sir William Gull, who never wrote a paper or made an address which did not bristle with aphorisms and epigrams. Gull in discussing the attitude of physicians towards medicine once remarked, "We have no system to satisfy, no dogmatic opinions to enforce. We have no ignorance to cloak, for we confess it."

In presenting this discussion of arterial hypertension, I do so quite in this spirit of Gull and wish to stress that I have no ignorance to cloak for I freely confess it. We do not know what the cause of arterial hypertension is and we do not know how to cure it. But this by no means carries the implication that we may not be on the very threshold of the discovery of both. The past decade has witnessed Abrams' "electrotonic reactions" and Wilshire's "magic horse-collar," but it has also witnessed the unravelling of some of the most difficult problems of human pathology and the successful employment of this knowledge in the treatment of disease.

Sir William Gull is also the originator of another epigram which is germane to this discussion. He once remarked that "fools and savages explain, wise men investigate." While I shall from time to time, perhaps unconsciously, gravitate into the ranks of the explainers, I shall try hard to keep in the company of the wise men who investigate.

It is very difficult to pursue the study of any disease without acquiring an exaggerated opinion of its importance. Phillipe Ricord, the great authority on syphilis, according to Oliver Wendell Holmes, "would have submitted Diana to treatment with his mineral specifics, and ordered a course of blue pills for the vestal virgins." We all know syphilographers with a similar mental twist.

However, it is no exaggeration to state that arterial hypertension is one of the outstanding medical problems calling for solution. We hear a great deal about the importance of diabetes and it is most certainly important, yet the average practicing physician sees ten cases of arterial hypertension to one of diabetes. How many cases of high blood pressure there are in this country we do not know. Most ideas on this subject belong rather to the realm of speculation than to the field of cold statistics. Fahr has estimated that in 1924 approximately one hundred and forty thousand people died in the United States from the immediate accidents or more remote effects of arterial hypertension—enough deaths to depopulate a fair sized city.

The question is often asked whether arterial hypertension is on the increase. This question should, I think, be answered in the affirmative. There has been much discussion as to whether our oft-quoted statistics about the lengthening of the life span may not be more apparent than real. Certainly the average length of life is much longer now than in previous centuries, due largely to the lowered mortality from infectious diseases in childhood and in young adult life. But it is a question whether a man of forty-five or fifty has a better chance of living longer than he ever had. However, there can be no question that there are more people of forty and fifty than there used to be. It has been said by someone, probably a man still in his thirties, that we are fast becoming a nation of old men, and although ones' definition of an old man shifts with each decade one passes, there are unquestionably more people now in the decades in which arterial hypertension occurs, and as a result more arterial hypertension.

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*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

When we consider the prevalence of arterial hypertension we are struck with the fact that it is very common among all the so-called civilized nations. While we are fond of attributing its prevalence in this country to our strenuous mode of life, yet it is very common in Europe where life still proceeds at a more leisurely tempo. And while the ruddy, full blooded, beef-eating Britisher and the ample proportioned beer-drinking German often develop high blood pressure, the more gracile and volatile Frenchman and Italian also have their troubles with this disease.

There is one striking exception to this university of high blood pressure—the Chinese, who, at least in China, do not suffer from high blood pressure. This fact seems well established from the statistics of life insurance companies doing business in China and from data compiled in the Chinese medical schools and hospitals. It is also noteworthy that the disease we call chronic glomerular nephritis is comparatively rare in China.

There has been, of course, much discussion about this immunity of the Chinese to high blood pressure. The temperament of the people and the Oriental philosophy of fatalism have been invoked as sufficient explanations. Some think the calm mode of life is the determining factor, although press reports from China, as well as the accounts of missionaries who have departed upon extremely short notice, do not lead us to believe that calmness and quietude are outstanding factors in the life of contemporary China. Some authors have believed that the relative immunity of the Chinese is due to their dietary habits. Frost has expressed the belief that the absence of meat in the dietary is the determining factor and has pointed out that, on the basis of the examination of candidates for life insurance, Australia, which has the highest per capita consumption of meat, shows the highest average blood pressure. One of the most logical explanations which has been advanced is that the Chinese have no hypertensions because they do not inherit the tendency to develop this condition. This view receives some support from the fact that the children of mixed marriages in China do not show this immunity as do those of pure Chinese blood —the hypertensive trait coming in with the European or American blood. But even if this view be correct the great question still remains unanswered, why their ancestors did not have hypertension. So this Chinese mystery remains unsolved. Some day it may be quite evident but today we "see through a glass, darkly."

One feature of the etiology of arterial hypertension about which there is no dispute is the important factor of heredity. No disease, with the possible exception of hemophilia and of certain familial nervous diseases, shows the same exquisite hereditary tendency as does arterial hypertension. Our chromosomes determine whether we are to have blue eyes or brown hair or, later, to have no hair worth mentioning. Beside hypertension the family tendency to tuberculosis, to cancer, to diabetes, pales into insignificance. We can predict with a great degree of certainty what the blood pressure of children born of two hypertensive parents will be in the course of time.

Unfortunately we can not tell our patients with hypertension that they should have picked different ancestors, any more than we can tell our psychoneurotic patients that it is unfortunate that their mothers were nervous. While we must admit, according to Oliver Wendell Holmes, that we are all but omnibuses in which our ancestors are taking a ride, we need not make the admission a corner stone of a fatalistic creed. Diabetes and hemophilia are both hereditary diseases, yet we have made much progress in our knowledge of their etiology as well as of their therapy. Pernicious anemia may also belong to this group but here a fatalist point of view has given away completely to a feeling of optimism.

We find in reviewing the subject of hypertension that some authors describe in great detail many kinds of hypertension and catalogue an imposing array of causes of hypertension. Undoubtedly we see various transient types of hypertension due to mental trauma, and to hyperthyroidism, and that one striking but rare variety, paroxysmal hypertension produced by adrenal tumors. However, the disease which we call essential hypertension, or hyperpiesia, or hypertensive cardio-vascular disease, seems to be a definite clinical entity, following a definite clinical course and terminating in an equally definite manner. This disease, it seems to me, is as definite a syndrome as Adams-Stokes disease or as coronary occlusion. It should be described as such in our medical treatises and not scattered around piece-meal, as is often the case, in the various sections on arteriosclerosis, chronic nephritis or what not.

In 1757, Theodore Tronchin of Geneva wrote an interesting book called "de colica pictonum." This book was a treatise on the colic of Poitiers, also called the dry belly-ache, or the Devonshire colic, a disease which Sir George Baker later proved was lead colic. Tronchin in his book describes an epidemic, in Amsterdam, of the colic which he says was due to the drinking of water which had run over leaden roofs and gutters. He discusses the effects of decaying leaves upon the lead gutters and the formation of lead salts soluble in water and seems quite clear and scientific but he spoils the book by describing seven additional causes of the colic of Poitiers. Some of the present day articles on hypertension may impress future readers very much as Tronchin's book impresses us today.

As we review the history of arterial hypertension we find that at first, under the influence of the brilliant studies of Bright, of Wilks, of Gull and Sutton all cases of high blood pressure were regarded as cases of chronic nephritis. Then, later, after the development of methods for studying blood chemistry and for estimating renal efficiency, it was found that many cases of high blood pressure showed no evidence of renal insufficiency and so these cases were placed in a separate catagory and called essential hypertension. Allbutt, as we know, who devoted years of thought and investigation to this problem, separated them sharply and called the disease hyperpiesia. More recently Keith, Wagener, and Kernohon have described a third variety, malignant hypertension, which runs its course more rapidly than the usual variety of hyperpiesia, and probably in less skillful hands is often diagnosed as glomerular nephritis.

We may ask ourselves frankly whether all three conditions may not really be differing manifestations of the same disease. We have an analogy in the course our conceptions of thyroid disease have taken in the past few years. Not so many years ago a very complicated system of classification of thyroid disease was popular. The essayist reading a paper on thyroid disease found the multiplicity of his classification limited only by the time allotted for the reading of his paper. Some pathologists described a different picture of thyroid pathology every time they looked at a new section of thyroid tissue. Hertzler has, I think, rendered a great service to the subject of thyroid pathology in considering all these various pictures as simply chapters in the life history of the thyroid gland. The story may unfold itself in different ways in different parts of the thyroid gland but it is, after all, the same story.

It would seem to me highly probable that what we call essential hypertension with its cerebral cardiac and renal terminations may be the same basic disease that we call chronic glomerular or chronic diffuse nephritis. The tempo or duration of the two diseases differ but essential hypertension after all may be, to employ the language of the screen, a slow motion picture of chronic nephritis. My own colleagues, the pathologists, confess that they can not differentiate the kidneys of a so-called essential hypertension with marked renal lesion from the kidneys of a patient diagnosed as chronic glomerular nephritis. Further, I am not sure that the ophthalmologists are any more successful in their studies of the retinal changes.

This point of view is strengthened by the investigations upon the frequency of arteriolosclerosis in arterial hypertension. The frequency of these lesions in the various organs apparently varies in different reports, but it is interesting that Fishberg in seventy-two cases of essential hypertension found arteriolosclerosis present in the kidneys in one hundred per cent and Bell and Clawson in their admirable study of four hundred cases of primary hypertension found a renal arteriolosclerosis in eighty-eight per cent of the cases.

The conceptions of the pathogenesis of arterial hypertension have revolved for the greater part of a century about two opposing views, the view of Gull and Sutton, that the cause of arterial hypertension is to be sought in a capillary fibrosis, and the view of Johnson that the capillary and arteriolar changes were not the cause of the hypertension but the result of the hypertension. This latter view, which many consider as a modern view, was very clearly stated sixty-four years ago. Sir George Johnson in 1868 expressed the belief that the cause of arterial hypertension was the continued contraction of the arterioles. Johnson later saw in the observations of Gowers a confirmation of his views. Gowers described five cases of Bright's disease in 1876 in which by studying the eye grounds with an ophthalmoscope, he saw a direct relation between the degree of constriction of the retinal vessels and the degree of arterial tension at the wrist.

Since the days of Gull and Sutton and of Johnson an enormous literature has accumulated upon this subject. There has been much speculation particularly as to whether the changes in the renal vessels are the cause or the result of hypertension. We clinicians have long been accustomed by our training at the necropsy table to give the pathologist the last word. Bell and Clawson in concluding their study of primary hypertension state that "on the whole, the evidence seems to favor the hypothesis that hypertension causes renal arteriolosclerosis." With this statement I am in full accord. These two and other observers have also pointed out that while there seems to be a close relationship between arteriolosclerosis and hypertension, sclerosis of the aorta and peripheral arteries show no definite relation to hypertension. This should be emphasized, for we still see physicians puzzled because a patient has pipestem radials and a normal blood pressure. While arteriolosclerosis and hypertension are twin brothers, arteriosclerosis is not even a member of the same family.

The pathological physiology of arterial hypertension is no less interesting than the pathological anatomy. According to Tigerstedt the normal blood pressure is the result of three factors, the force of the heart beat, the quality and quantity of the blood and the degree of peripheral constriction. An elevation in blood pressure may then be the result of an increase in any one of these three factors.

Hypertension as the result of an increase in the force of the heart beat alone is rarely seen clinically. The same may be said for hypertension due to changes in the quality and quantity of the blood. Theoretically an increase in the viscosity of the blood is invariably raised but Vaquez, who first described this disease, has recently stated that most of these patients show no elevation in blood pressure. We are left then only the third alternative, that clinically an elevation in blood pressure is associated with an increase in peripheral resistance. And indeed the evidence is constantly accumulating that this is the important and determining factor.

The studies on the capillaries and arterioles of the skin and of mucous membranes have aided greatly in the elucidation of this problem. The names of Kylin, Otfried Müller, Lange and George Brown are associated especially with research in this field. While there are certain disagreements in interpretation, and even more marked discrepancies in the description of the appearance of the arterioles and capillaries, there seems general agreement that there is a state of increased tonus of the arterioles in arterial hypertension, and especially is there a widespread constriction of the smaller arterioles.

What is the cause of this constriction? Sir George Johnson, as far back as 1868, expressed his conviction that arterial hypertension was the result of a continued contraction of the arterioles, and observed that "the minute arteries in any part of the body may be excited to contract, by their contents becoming abnormal and therefore more or less noxious to the tissues." Some years later Sir William Broadbent, in 1890, stated his adherence to the views of Johnson, and said that the cause "can scarcely be other than some substance present in the blood which acts directly upon the capillary walls." He adds that "the special material which plays this part is almost certainly nitrogenized waste which has not undergone the complete oxidation necessary for elimination."

Both of these statements were made before we had the modern methods of blood analysis which grace our present day biochemistry. They were perhaps only shrewd guesses, yet we must admit that we are still indulging in guesses regarding this abnormal and noxious substance in the blood.

There has been a great deal of search for substances in the body having a pressor effect but the only one that has been positively identified and isolated is adrenalin. Some observers, notably von Neusser and Vaquez, have suggested that hypertension may be the result of an excess secretion of adrenalin. Some of their enthusiastic disciples have even gone so far as to propose that we call hypertension hyperadrenalinemia. Unfortunately no one has ever demonstrated an excess of adrenalin in the blood of patients with arterial hypertension. There is, however, one rare type of hypertension, the so-called paroxysmal hypertension, which is unquestionably due to an adrenal tumor. Pincoffs has described such a case in which an extract of the adrenal tumor contained large amounts of a pressor substance, and it seems only reasonable to conclude that the paroxysmal attacks of hypertension are due to a sudden release of this pressor substance, probably adrenalin, into the blood-stream. These cases, however, differ particularly because of the paroxysmal appearance of their attacks, from the syndrome we are discussing.

Increased amounts of uric acid, of sugar, and of cholesterol have been observed in the blood of hypertensive patients. These findings are interesting but we do not know what they mean. None of these substances have a hypertensive effect and it is noteworthy that the highest blood sugars we see are in diabetes, the highest blood cholesterol is in lipoid nephritis and diabetes and the highest blood uric acid in leukemia and gout —all diseases which have no close relationship to arterial hypertension.

For several years we have been interested in the possibility that an increased amount of certain guanidine bases in the body, may play a rôle in arterial hypertension. We have described a method for the quantitative estimation of guanidine in the blood and applied this method to the study of the blood of hypertensives. Up to the present time we have studied more than five hundred cases of hypertension. Approximately sixty per cent of the cases of "essential" hypertension have shown an increase of "guanidine" in the blood while one hundred per cent of the cases of chronic nephritis have shown this increase.

The statement has been frequently made in the literature that our results have not been confirmed. So far as I know only two observers have repeated this work. Davis found blood guanidine much higher than normal in a series of hypertensive patients and Pfiffner and Myers state they have confirmed our findings.

In all of our communications we have emphasized the fact that we do not know positively what this substance is which is increased in the blood of hypertensives, and that we employ the term "guanidine" in quotation marks. We can not be positive that it is a guanidine base until it is definitely isolated and this, at present, is a chemical problem which has not been solved. However, the substance responsible for the reaction behaves very much like guanidine. There is also good evidence that in chronic nephritis guanidine bases are increased in the blood.

The weakness of this theory lies in the fact that the known guanidine compounds that have been isolated in the body—arginine, creatine and creatinine—have no effect on the blood pressure. Recently, however, Komarow has described methyl guanidine, a powerful pressor compound, in muscle tissue. We have not been able to prove the identity of this substance which is increased in the blood of hypertensives but we feel sure it is neither arginine, creatine or creatinine.

While the possibility that hypertension is due to an excess amount of a pressor substance has been extensively discussed, the opposite hypothesis has received little attention. It is theoretically just as plausible that hypertension may be due to the lack of a depressor substance as that it is due to an excess of a pressor substance. Indeed it is striking that while it has been extremely difficult to demonstrate more than one pressor substance, several depressor substances have been isolated and there is good evidence that there are others as yet not isolated and unidentified. We have discussed on other occasions this possibility that hypertension may be due to a lack of depressor substance—a type of deficiency disease—and during the past few months Wollheim and Lange, working in von Bergman's clinic in Berlin, have reported a very interesting observation. They state that there is, in the normal urine, an unidentified substance which has a depressor effect and that the urine of hypertensives shows little or none of this substance. This observation, if confirmed, is a very important one.

In summarizing the present knowledge regarding the immediate cause of hypertension we have suggestive evidence that there is an increased amount of a guanidine compound in the blood of a majority of cases of hypertension and in practically all cases of chronic glomerular nephritis. It can not be asserted, however, that this substance is the cause of hypertension since it may be only some retention product which accumulates because of renal insufficiency. Whatever its significance it is worthy of further study.

If our knowledge of the etiology of arterial hypertension is shrouded in a certain haze, our knowledge of an effective therapy in this disease is enveloped by a dense fog. However, we can relieve most patients of their most disagreeable symptoms, prolong the lives of many and in some instances apparently aid the patient to a spontaneous recovery.

The general principles of treatment are well known to you. When the patient is overweight he should be reduced. This procedure alone in some instances reduces the pressure. The fluid intake should be reduced since there is excellent evidence that there is a relationship between intake and blood pressure. The patient's heart should be under careful scrutiny and at the first sign of lagging, digitalis should be administered.

There is a great deal of discussion in regard to the advisability of lowering the blood pressure in arterial hypertension. The physician often remarks to the patient, "Well, you have been going at high pressure so long I do not think it wise to lower your pressure." This is a favorite remark. I have used it, especially with those patients whose pressure I knew I could not lower.

This view is often a refuge rather than a conviction. However, there are two conditions associated with arterial hypertension in which a marked lowering of blood pressure is certainly inadvisable. The first of these is a marked cardiac hypertrophy. When we lower the blood pressure markedly, we diminish the flow in the coronary arteries. Anyone can prove this to his satisfaction in the physiological laboratory. If a patient has a large heart which is laboring under the strain of a hypertension, it obviously needs an increased coronary circulation and any reduction in this circulation may be disastrous. Nor is this idle speculation. We have seen patients with large hearts, following a marked fall in blood pressure, show definite anginal symptoms.

The second contra-indication to a marked lowering of blood pressure is cerebral arteriosclerosis or arteriolosclerosis. Many patients with arterial hypertension, as Bordley and Baker have shown, have sclerosis of the cerebral vessels. In such patients a marked fall in blood pressure may interfere with the cerebral circulation and cause alarming symptoms such as marked dizziness, staggering, mental lassitude and torpor or even unconsciousness.

I do not believe we often see these complications because, to quote Mackenzie, "The efforts employed to reduce the blood-pressure are usually of little effect."

While it may not be desirable to reduce the blood pressure to normal levels, in many instances a certain reduction may be desirable. I do not agree with the school who would have us believe that high blood pressure is compensatory, or protective and should be left alone. A certain elevation in blood pressure like an elevation in temperature may be a protective phenomenon. Yet I doubt whether a pressure of 240 is protective any more than a temperature of 106° F. The difference between a pressure of 200 and 180 may be the difference between severe headaches and no symptoms, and yet if we try to prove that we had accomplished this therapeutic result, the skeptic would regard our blood pressure record with an easy tolerance and explain the disappearance of the headaches with that magic adjective —psychic.

Bodily, nervous and mental rest unquestionably lower the blood pressure. Many sedatives, notably those of the barbituric family, are of great aid.

The most promising field of therapy, it seems to me, lies in a study of the depressor substances in the body. Perhaps I am unduly optimistic like Micawber, but I hope I am not just waiting around for something to turn up.

The existence of a number of depressor substances in the body has been demonstrated during the last few years. Those which have been identified are histamine, choline, aceto-choline, adenylic acid and adenosine. Therapeutically these substances have as yet proved disappointing. However, there are others left. We have been working for some time in the attempt to isolate and identify a depressor substance which is present in several tissues in the body, notably the brain. Such substances probably play a definite physiological rôle in health and an understanding of this rôle may unravel for us many problems relating to the etiology and treatment of high blood pressure.

It would be interesting to speculate on these unidentified depressor substances or on the rôle of histamine, choline, aceto-choline, adenylic acid and adenosine. But I do not wish to be classed with fools and savages who explain, but rather with Gull's wise men who investigate.

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DISCUSSION

Dr. George E. Brown (Rochester, Minn.): Dr. Major's work is probably the first intelligent, prolonged investigation of one of the most important phases of hypertension. As you know, he has been at this work a number of years. As a result of his report this afternoon one gathers a very distinct sense of encouragement that this intensely interesting disease which we call hypertension may have a chemical basis.

As far as we know anything of hypertension (I am speaking of so-called essential hypertension) the familial factor seems clear. Sometimes there are striking exceptions. In between 50 and 75 per cent of the cases we see, this familial tendency can be definitely established. The question is, what is the basis of this familial or inheritable trend? How are vasomotor patterns transmitted? When we turn to the men who are investigating problems of inheritance, they state that this potentiality rests in the chromosomes. May not the factor that is transmitted through the chromosomes be some fault in chemical metabolism, perhaps an increase or a decrease, or lack of some potent substance that has to do with keeping our blood pressure within the so-called normal range? There is no normal blood pressure. If we took the blood pressure of everyone in this room, from minute to minute, we would find it to be fluctuating. We could divide the subjects into three groups: one group in which the fluctuations of blood pressure from minute to minute would not exceed 5 or 10 mm. of mercury; another group in which the fluctuations would be twice or three times this, and a third group in which fluctuations would be from 40 to 60 mm. of mercury. The last group would be composed of persons with true hypertension.

These conclusions are based on some interesting work that we have been carrying out. Dr. Hines and I have developed a standard stimulus by which to study vasomotor fluctuations. If you put your hand in ice water, at a temperature of 4° to 5° C., hold it there a minute or two, and watch the blood pressure, you will note a definite rise of pressure, which, however, within a minute will return to the level that existed before examination. Among 100 persons between the ages of twenty and thirty-five years, approximately 5 to 10 per cent will have abnormal rise resulting from local application of cold. Still, these subjects do not have hypertension, at least not clinically. The question arises, are these people going to have hypertension? Interestingly enough, practically all have the "hypertension strain" in their families.

This all goes back to the problem Dr. Major discussed this afternoon, namely the possible chemical basis for hypertension. If guanidine or depressor substances are of etiologic significance, they ought to be obtained from the bodily tissues or fluids of subjects who are going to have hypertension. I should think that that would be the next step in this investigation.

EXPERIMENTAL EVIDENCE FOR INTRAVENOUS VACCINE THERAPY IN CHRONIC ARTHRITIS*

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THE conclusions drawn from the experiments reported in this paper, insofar as chronic arthritis is concerned, are based upon the assumption that chronic arthritis is, for the most part, an infectious disease due to streptococci. This assumption is strongly supported by bacteriological, immunological, and pathological findings.

The experiments have to do with the development of a method of administering a streptococcic vaccine which will not produce hypersensitiveness (allergy) but will desensitize patients already hypersensitive and will produce a high degree of protective immunity. The subcutaneous and intravenous methods of giving a vaccine were studied relative to hypersensitiveness, desensitization, and protection.

Hypersensitiveness (allergy).—In a previous report it was found that the degree of tissue response in animals could be used as an indicator of hypersensitiveness. The tissue response was compared in normal animals with that in animals injected subcutaneously and intravenously with live streptococci. The degree of hypersensitiveness was 2.2 per cent in the normal animals, 88 per cent in the animals injected subcutaneously, and 1.1 per cent in animals injected intravenously. The average agglutination titer was 1:3200 in the animals injected subcutaneously and 1:200,000 in the animals injected intravenously.

These experiments showed that subcutaneous injections caused the development of a hypersensitiveness and that intravenous injections did not. The subcutaneous method did not desensitize the hypersensitive animals, for hypersensitiveness is produced and maintained by subcutaneous injections.

Desensitization.—Ten animals were made hypersensitive and later vaccinated intravenously with *Streptococcus viridans*. The vaccinated hypersensitive animals gave a tissue response of 5.2 per cent as compared with 88 per cent in the nonvaccinated hypersensitive animals. The average agglutination titer in the nonvaccinated hypersensitive animals was 1:3200 and in the vaccinated hypersensitive animals 1:50,000. The hypersensitive animals were desensitized by the intravenous method of vaccination. As far as hypersensitiveness is concerned, the intravenous method of vaccination rather than the subcutaneous method should be used.

Protective immunity.—It was found in the preceding experiments that the streptococcic agglutination titers were higher in animals injected intravenously than in animals injected subcutaneously. To test the protective merits of the subcutaneous and the intravenous methods of injecting a streptococcic vaccine, two groups of animals were selected. Group 1 was vaccinated subcutaneously at five weekly intervals with one billion killed streptococci. Group 2 was vaccinated intravenously at the same periods with the same doses. The animals vaccinated subcutaneously had agglutination titers ranging from 1:1600 to 1:6400. The animals vaccinated intravenously had titers of from 1:200,000 to 1:400,000.

The evidence of a correlation between the height of an agglutination titer and protection was shown by comparing the rate at which streptococci were killed in normal animals and in animals which had a high agglutination titer. Normal rabbits and rabbits highly immune to streptococci were injected intravenously with 50 million live streptococci. In fifteen minutes 1 c.c. of blood was taken from the heart of each animal and plated on agar. It was found that the rate of disappearance of the streptococci from the blood in fifteen minutes was three times greater in the immune than in the normal animals. The streptococcic agglutination titers averaged 1:45 in the normal animals and 1:170,000 in the immune animals.

Since the agglutination titer rises decidedly higher by the intravenous method of vaccination than by the subcutaneous method and since the above experiments showed a correlation between an elevated agglutination titer and desensitization and immunity, the intravenous method of administering a vaccine would seem to be the one of choice.

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*From the Department of Pathology, University of Minnesota. Read at the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

Type or species specificity in desensitization and protective immunity.—If desensitization and immunity should be type (strain) specific, then it would seem that autogenous vaccines should probably be used in most cases. If, on the other hand, these two phenomena should be only species (group) specific, then a stock vaccine would in most cases likely be sufficient. The following experiments show the relation of acquired desensitization and immunity to strain and group specificity.

Animals made hypersensitive to *Streptococcus viridans* of acute rheumatic origin were vaccinated intravenously with *Streptococcus hemolyticus* from a case of puerperal sepsis. The degree of hypersensitiveness to *Streptococcus viridans* was then determined and found to be 0.4 per cent as compared with 88 per cent in nonvaccinated hypersensitive animals. The desensitization did not seem to be type (strain) specific.

In a series of animals each animal was immunized with a different strain of streptococcus of chronic arthritic origin and later each of the animals was injected with 50 million organisms of another strain of streptococcus. The rapidity with which this organism disappeared from the blood (tested in fifteen minutes) was much greater than in normal animals. These experiments suggested that protective immunity was also not strain specific.

Nonspecific protein therapy (B. typhosus) in streptococcic infections.—Animals were made hypersensitive to *Streptococcus viridans* and later vaccinated intravenously with *Bacillus typhosus.* The degree of hypersensitiveness to *Streptococcus viridans* remained practically the same as in the nonvaccinated hypersensitive animals. It was concluded that desensitization to streptococci was not brought about by a nonspecific protein reaction.

Animals vaccinated intravenously with *Bacillus typhosus* developed a high agglutination titer to *Bacillus typhosus.* The titer to *Streptococcus viridans* was raised but slightly. When these animals were injected intravenously with 50 million streptococci, it was found that the rate at which streptococci disappeared from the blood was even less than in normal animals. Protection against streptococci was not brought about by intravenous vaccination with *Bacillus typhosus.*

The above experiments supply the following conclusions as a basis for intravenous streptococcic vaccination in chronic arthritis:

1. Subcutaneous injections of a streptococcic vaccine do not desensitize the hypersensitive individual but tend to increase the hypersensitive state.

2. The subcutaneous method develops only a slight degree of protection.

3. The intravenous method of giving a streptococcic vaccine desensitizes the hypersensitive patient, does not develop hypersensitiveness, and does cause a high degree of protective immunity to be developed.

4. Neither the desensitizing nor the protective phenomena are strain specific but they appear to be group specific. They are not of the nature of a nonspecific protein reaction.

5. From the standpoint of both desensitization and resistance the intravenous method rather than the subcutaneous method of giving a streptococcic vaccine in chronic arthritis is indicated. Intravenous injection of *Bacillus typhosus* in treating chronic arthritis would seem to be contraindicated.

THE TREATMENT OF CHRONIC ARTHRITIS*

THE ROLE OF INTRAVENOUS STREPTOCOCCIC VACCINE

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THE problem of treatment in chronic arthritis has been a difficult one in the past because of the uncertainty as to the specific agent causing the disease. The bacteriological, pathological, and clinical evidence accumulated in the past few years points strongly towards streptococcic infection in a majority of cases. The literature on this subject has been recently reviewed by us.[1] From the evidence at hand it is our impression that about 90 per cent of the cases of true arthritis are due to such streptococcic infection. Other cases of chronic arthritis are due to gonococci, bacillus tuberculosis, occasionally spirochetal involvement, and possibly in some cases staphylococci, though there is very little definite evidence of the latter as an etiological agent. In considering the history, findings, and roentgen studies, gonorrheal, tuberculous and syphlitic arthritis can usually though not always be distinguished from streptococcic arthritis. There are also certain non-infectious joint conditions that must be differentiated from arthritis, namely, traumatic joints, senescent changes, and gout. Unfortunately the term arthritis has been used loosely in the past to cover some such conditions that are obviously not due to infection. There also is some controversy at the present time as to which cases are and are not of infectious origin. We have been unable to place our patients into such distinct classes as (1) rheumatic fever; (2) rheumatoid arthritis (atrophic infections, proliferative); and (3) osteo-arthritis (hypertrophic, degenerative). It is our opinion that there is in general a gradual gradation in the clinical types of streptococcic arthritis from childhood to old age. This opinion is based on bacteriological, pathological, and immunological studies as well as roentgen and clinical observations and is to be reviewed fully elsewhere.

The treatment of arthritis falls into two classes: (1) specific, directed at the causative agent; and (2) secondary, directed at the contributing factors and the patient's general well being. The chief consideration here will be specific treatment in the form of intravenous streptococcic vaccine therapy for those patients with arthritis of presumable streptococcic origin. The intravenous method was used because of the basis established by Clawson.[2, 3, 4] In the treated group have been included all cases in which there was no other clear cut cause such as gonorrhea, tuberculosis, or syphilis. Older individuals without joint pains and with senescent new bone production largely found by roentgen ray were not considered as arthritis of any type and of course were not treated. No further selection of cases was made other than that the joint pain had been persistent for at least two months. The patients were from the out-patient department of the University of Minnesota Hospital. They were largely ambulatory although a number were using canes or crutches or brought in by wheel chairs. A few of the patients with severe involvement were placed in the hospital. Eighty-eight per cent of the patients had had arthritis for more than one year.

Method.—At the present time six hundred patients have received intravenous streptococcic vaccine therapy. Undoubtedly a few patients with gonorrheal or tuberculous arthritis and occasionally other types may be confused with streptococcic arthritis and in case of doubt such patients have been treated.

The strain used was isolated from an individual with clinical rheumatic fever and pericarditis and has been used experimentally for the past nine years. This strain is of low virulence, not a self agglutinator, and cross agglutinates in high titer with many other strains of streptococci from patients with clinical rheumatic fever and chronic arthritis.

The initial dose was 100 million and this was usually increased by 100 million at each weekly injection until at least eight injections were given. The increase in dosage and maximum dose given were dependent on the reactions and clinical improvement. The maximum dose did not usually exceed 800 million killed organisms. In some of the earlier cases treated a maximum dose of five billion had been given but now discontinued because of no greater improvement and more severe reactions than with the smaller doses. It is of interest that untreated arthritic patients with high initial agglutinating titers responded no better to therapy than those with lower titers.

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*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

TABLE I. RESULTS OF THERAPY
(301 cases)

	Number of cases	Per cent
Definite clinical improvement	233	74.4
Questionable improvement	19	6.3
No improvement	49	16.3

TABLE II. CRITERIA FOR IMPROVEMENT

	Number of cases	Per cent
1. Joint pain (282 cases)		
Decreased pain	233	82.6
Unchanged	49	17.4
2. Joint swelling (197 cases)		
Decreased swelling	160	81.2
Unchanged	37	18.8
3. Joint motion		
Increased motion	206	84.7
Unchanged	37	15.3

TABLE III. TIME OF BEGINNING DEFINITE IMPROVEMENT

Number of treatments	1	2	3	4	5	6	7	8	9	10	Over 10
Number improved	13	39	46	47	34	18	13	8	11	2	2
Percentage improved	5.6	16.7	19.7	20.2	14.5	7.7	5.7	3.4	4.7	1.3	1.3
Total percentage improved	5.6	22.3	42.0	62.2	76.7	85.5	90.2	93.6	97.4	98.7	100

TABLE IV. INITIAL AGGLUTINATION TITER IN CHRONIC ARTHRITIS
(300 cases)

Dilution	1:0	1:50	1:100	1:200	1:400	1:800	1:1600	1:3200	1:6400
Number	30	33	67	73	64	25	6	1	1
Per cent	10	11	22	24	21	8.3	2	0.3	0.3

Reactions.—Reactions of some sort were experienced following about fifty per cent of the injections. These usually consisted of moderate fever and chills coming on two to ten hours after the injection. There was no correlation between improvement and reactions experienced.

Results.—In the consideration of results it is important that these individuals were out-patients receiving no medication and living their usual life at home. Clinical improvement was based on three criteria: (1) decrease in pain; (2) decrease in joint swelling; (3) increase in joint motion (Table I).

Excluding the nineteen questionable cases the results for the different criteria for improvement are tabulated as in Table II.

The improvement has been manifested as frequently in those with predominating hypertrophic bone changes as in other clinical variations. The individuals with very extensive involvement have been the most difficult to improve. A significant factor in considering this high percentage of improvement is that these patients received no other therapy, not even rest, and were at home living their usual lives.

Number of Injections Necessary for Clinical Improvement.—Nearly two-thirds of the patients experiencing improvement did so after five injections; nine-tenths did so after seven injections (Table III).

Agglutination Titers and Vaccine Therapy.—The greatest percentage of untreated arthritic patients showed an agglutinating titer of 1:200 with the strain of streptococcus used in the vaccine, which was about the same as for a group of "normal" persons whose serums were used with this safe strain (Table IV). The intravenous vaccine therapy stimulated a rise in the agglutinating titers in the serums of most patients. Clinical improvement occurred most frequently when the titer was 1:6400 or more (Table V). The height of the agglutinating titer seemed to be a reliable indicator in most instances of the protection possessed by the patient against streptococci. Patients with clinical improvement usually showed a correlated high agglutinating titer. Improvement was maintained as long as the titer remained definitely elevated. Symptoms returned when the titer again became low and subsided following further treatment and re-elevation of the titer. As a further check on the significance of the agglutinating titer, the bactericidal power of the blood for streptococci was determined by using the method of Sutliff and Rhoades,[5] who determined the bactericidal power of the blood for pneumococci in patients with lobar pneumonia. We tested the blood of normal individuals untreated and treated arthritic patients. The blood from treated patients with an agglutination titer of 1:6400 or more was found to have a much higher bactericidal power against the streptococci used in the vaccine than did the blood of normal patients, untreated arthritic patients or treated patients with low agglutinating titers.

TABLE V. DISTRIBUTION OF MAXIMUM AGGLUTINATION TITER IN 188 IMPROVED TREATED ARTHRITIC PATIENTS

Titer	1:800	1:1600	1:3200	1:6400	1:12800	1:25000	1:50000	1:100000
Number	4	9	27	54	71	20	3	0
Percentage	2.1	4.7	14.3	28.8	37.8	10.6	1.7	
Total percentage	2.1	6.8	21.1	49.9	87.7	98.3	100	

TABLE VI. DURATION OF ELEVATED AGGLUTINATION TITER AND CLINICAL IMPROVEMENT FOLLOWING A COURSE OF THERAPY AND WITHOUT FURTHER INJECTIONS

Patient	Time since treatment	Titer after course of treatment	Titer after interval	Improvement sustained
1	10 mo.	100,000	6,400	Never improved
2	8 mo.	6,400	6,400	+
3	7½ mo.	6,400	3,200	+
4	7 mo.	25,000	25,000	+
5	7 mo.	12,800	6,400	+
6	6 mo.	1,600	3,200	+
7	6 mo.	25,000	6,400	+
8	6 mo.	6,400	6,400	+
9	6 mo.	12,800	6,400	+
10	5 mo.	25,000	25,000	+
11	4 mo.	6,400	12,800	+
12	3 mo.	1,600	12,800	+
13	3 mo.	....	3,200	+
14	3 mo.	12,800	3,200	—
15	2½ mo.	6,400	12,800	+
16	2 mo.	25,000	800	—
17	2 mo.	6,400	1,600	+
18	2 mo.	12,800	6,400	+
19	2 mo.	3,200	6,400	+
20	2 mo.	6,400	6,400	+

Duration of Improvement and Elevation of the Agglutinating Titer.—The titer will often remain elevated for many months in some patients and for shorter periods in others. Clinical improvement and elevated agglutinating titers have persisted in a number of patients for as long as two to eight months without treatment (Table V). If there be a recurrence of symptoms, one or two weekly injections will usually re-elevate the titer and again bring about clinical improvement.

Contraindications to Intravenous Vaccine Therapy.—We have not treated pregnant women because of the frequency with which abortion was produced in pregnant hypersensitive rabbits receiving intravenous injections of streptococci. We considered it inadvisable to administer similarly intravenous vaccine to patients with chronic arthritis who also had glonerulonephritis. In acute phases of arthritis with persistent fever the dosage has been reduced or treatment postponed until the acute febrile period has ended.

Follow-up Study.—At the present time we are conducting a follow-up study of over 100 patients who received the first treatment more than a year ago. This analysis is not yet completed but in general is very encouraging. There is much variation in the frequency of therapy required to maintain clinical improvement and with it an elevated agglutinating titer. Some individuals require therapy every few weeks over a long period of time while others may go at least eight months without symptoms. In most cases of well established arthritis there has been an alleviation of symptoms and an arrest in progress of the disease rather than a cure. In early cases many are apparently completely free from symptoms. Such patients of course often improve without therapy. While it is difficult to draw conclusions from the treatment of these early cases they undoubtedly are the individuals who urgently require treatment with the hope of preventing serious future damage. One important point to emphasize in regard to intravenous streptococcic vaccine therapy is that it is inexpensive and does not interfere with the patient's work and activities.

Secondary Factors in the Treatment of Arthritis.—In our series we have ignored other methods of treatment in order to evaluate the intravenous streptococcic vaccine therapy alone. We feel that that type of treatment has accomplished better results than the methods which we term secondary. Other authors, however, have been very enthusiastic in the support of some of those methods. In treating arthritis everything should be done that may be of therapeutic value and that is economically practical to use. Obviously it is impossible to use many of the methods advised for all cases, because of the expense and inconvenience incurred. The following secondary therapeutic methods are discussed briefly:

1. *Rest* is undoubtedly of value in the treatment of arthritis as in any other infection. During acute stages bed rest is often of value although it is usually inadvisable to completely immobilize any joint for a long period of time. The rest factor must be regulated to suit the individual case.

2. *Diet* is considered by some investigators as of primary importance in the treatment of chronic arthritis. Colonic roentgen studies have shown stasis and dilatation of the colon in a significant percentage of arthritic patients. Pemberton[6] is of the opinion that there is an intolerance to carbohydrate foods and a lowered sugar tolerance in such individuals. Fletcher[7] has pointed out the advisability of sufficient Vitamin B in the diets of chronic arthritic patients. A few have advocated colonic flushes in the treatment of arthritis though there seems some question as to the advisability of this procedure. Most authors are in accord in advising proper bowel management and the control of constipation, when present, by dietary measures, avoiding cathartics and using sufficient quantities of cooked fruits and cooked green vegtables to obtain normal stools. In obese individuals weight reduction by dietary means seems advisable if only to lessen the traumatic influence on the spine, sacro-iliac, and lower extremity articulations.

3. *Massage and physiotherapy* in some form are often resorted to in treating chronic arthritis. Such treatments are extensive in their variations and range from the use of a hot water bottle to an extensive stay in an institute for bath and massage therapy. It is impossible to adequately discuss these methods here other than to state that they often bring some relief but not often a prolonged effect. The expense incurred by such methods is often unjustifiable. Certain home measures of using dry heat, the use of a simple light box and supervised massage and exercises are of practical value in many cases. The proper use of sunlight and ultra violet lamps are probably of some value in treating arthritis.

4. Exposure to wet is often a factor not only in inciting an arthritis but also in aggravating the condition once it is present, and occupations requiring such exposure should be avoided by arthritic patients. Climate undoubtedly plays an important rôle in the incidence of arthritis and climatic change may be of some value in therapy.

5. *Endocrine disorders* have been mentioned as playing a rôle in inciting and aggravating arthritis. Whether this be joint pain on some metabolic basis or true arthritis is not always clear. Both hyperthyroidism and hypothyroidism have been said to be inciting and aggravating factors in arthritis which will be benefited by proper treatment of the thyroid condition. The menopause has been said to be in some way associated with some cases of arthritis although the exact basis is not clear.

6. *Medications* of many types have been used in arthritis. Drugs of the salicylate group have probably been used most frequently to bring relief from pain. Cinchophen and neocinchophen have also been used frequently, though they have fallen into some disfavor because they have caused serious liver damage in a few instances. Iodine, arsenic, and sulphur have also been used somewhat, with variable relief of symptoms. Iron in the form of Blaud's (60-80 grains per day) or Iron Ammonium Citrate (6-8 grams per day) is usually of much value in treating the anemia which frequently is present in arthritic patients.

7. *Vaccine therapy* (other than intravenous streptococci) has been used rather extensively in the past. Streptococci have been used most extensively in varying doses and with variable reports as to value. Clawson's experimental work on animals would make it appear that streptococci subcutaneously or intramuscularly would be of little value if not contra-indicated because of the danger of producing hypersensitiveness, although Crowe,[8] Small,[9] and Burbank[10] have re-

ported favorable results with small doses over a long period of time. Typhoid bacilli have been injected intravenously and intramuscularly in many cases. A few fatalities have been reported following the intravenous use. Some authors have reported beneficial results in many cases. About fifty patients in our series had previously received intravenous typhoid vaccine. Our experience here with typhoid intravenously has been unfavorable, as only an occasional patient had reported any improvement following therapy. Individuals vaccinated with typhoid have not shown a rise in the streptococcic agglutinating titer and Clawson has had similar experience with experimental animals. Other injections such as sterile milk have been used in treating arthritis and this too has been of very little effect in our experience although some authors have felt it to be of value. The benefit occasionally derived from foreign protein therapy is probably on a basis of the thermal reaction rather than any antibody effect.

8. *The removal of foci of infection* is frequently mentioned as of primary importance in the treatment of arthritis. Definite foci are not demonstrable in a majority of cases, but when present merit attention. Radical treatment of unlikely areas seems hardly indicated. In early arthritis the removal of probable foci has often seemed of great value although in the well established cases the elimination of such foci has seemed of very slight value. In some cases of arthritis there has been a marked exacerbation of symptoms following such removal. In our practice foci have not been eliminated before satisfactory intravenous streptococcic vaccine therapy had been given and the agglutinating titer raised to at least 1:6400.

9. *Orthopedic measures* are often of great value in the prevention and correction of deformities and coöperation with an orthopedist is of value in the management of many arthritic patients.

SUMMARY

Six hundred patients with chronic arthritis have been treated with intravenous streptococcic vaccine therapy and in the group analyzed about 80 per cent have shown definite clinical improvement in less than ten weeks as determined by a decrease in pain and joint swelling and by an increase in the motility of joints. The height of the agglutinating titer corresponds fairly closely with clinical improvement. A titer of 1:6400 with this particular strain usually is necessary for clinical improvement, although 1:3200 is sufficient in some cases and even lower in a few others. Many patients who have shown a recurrence of joint pain after discontinuing therapy have shown a decrease in the agglutinating titer and have again noted improvement after sufficient therapy to again elevate the titer to 1:6400 or more. Many of the unimproved patients have been those in whom we have been unable to elevate the agglutinating titer to a level of 1:6400 or more, forty per cent of the unimproved group showing such low titers. Some unimproved patients have had agglutinating titers above 1:6400. The reason for lack of clinical improvement in such patients might be explained on several grounds such as: (1) the arthritis being of non-streptococcic etiology; (2) the arthritis being due to a streptococcus not biologically related to the injected strain; and (3) the infection being so extensive that the immunity produced was insufficient to produce a clinical effect.

We have limited our therapeutic measures in a large group of ambulatory patients to vaccine therapy alone in order to determine the value of this one method of treatment, but feel that in certain cases other methods should be employed, such as rest, physiotherapy, massage, diet, medication, and change of climate. The application of such measures depends largely on the degree of arthritis and the economic conditions in the case. In general all methods of therapy are most effective early in the disease before marked pathological changes have taken place. It has been our impression that specific therapy in the form of intravenous streptococcic vaccine has been of greater value in a higher percentage of cases than any of the secondary methods employed.

CONCLUSIONS

1. Eighty per cent of the patients receiving intravenous streptococcic vaccine have manifested clinical improvement.

2. This improvement has occurred in less than ten weeks in nearly all instances.

3. The agglutinating titer of the patients'

blood rose during the course of treatment. Improvement as a rule did not take place until the titer had risen to 1:6400 or more.

4. The height of the agglutinating titer in most cases seems to be a reliable indicator of the degree of the patients' protective immunity to streptococci.

5. Clinical improvement and a high agglutinating titer may be sustained without therapy for a variable period of from a few weeks to many months.

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DISCUSSION OF PAPERS BY DR. CLAWSON AND DR. WETHERBY

Dr. F. H. K. Schaaf (Minneapolis): The recognition that sensitization is an extremely important factor not only in acute but in chronic infections as well has been recently emphasized. In acute conditions, particularly in the study of tularemia and undulant fever, we have found that sensitization undoubtedly is a very important factor in the production of clinical symptoms.

I think the recognition that sensitization and anaphylaxis may be very contributory factors in chronic arthritis is a great step in advance, because of the failure of the old metastatic infection theory that we were merely dealing with metastatic processes in the joints.

In the original work we first noticed that in horses, when they were being immunized to produce antitoxins, subcutaneous injections of live organisms for some weeks would produce both endocardial and joint changes. It was also found that these joint changes were not only produced by streptococci, but by pneumococci, and different other organisms. In other words, I don't believe we have any right to assume that the streptococcus is the only organism that will produce chronic arthritis.

I admit that intravenous vaccination, at least according to the evidence presented, seems to be a definite step in advance, but as to whether or not it is going to solve the problem can only be told after we have observed these cases for a period of two, three or more years, because our greatest problem has been not so much temporary clinical improvement but prevention of recurrence.

I must say that in many instances the use of foreign proteins, such as milk, blood, horse serum, or no matter what it is, has given me temporary results, sometimes very startling, particularly in the monarticular forms. But the greatest difficulty has been the recurrence after a year or two. Whether or not the intravenous vaccination will solve that problem, only time will tell.

Dr. M. J. Shapiro (Minneapolis): The use of streptococcus vaccine intravenously in the treatment of chronic arthritis and other rheumatic infections is based on the following four premises:

1. That the streptococcus causes chronic arthritis as well as rheumatic fever.

2. That the agglutination reaction is a specific one and that it indicates that there has been an increase in antibodies and that the patient's resistance has been increased by the administration of the vaccine.

3. That all types of rheumatic infection are part of the same disease, that the clinical difference can be explained by the differences in age of the patients.

4. That a subjective symptom such as the relief of pain can be accepted as a therapeutic index in such a condition as chronic arthritis.

A review of the most recent literature reveals the fact that there is anything but agreement on the importance of the rôle of streptococcus in rheumatic disease. While it is true that such excellent investigators as Cecil and Clawson have found a high percentage of positive cultures from the blood of patients with both chronic arthritis and rheumatic fever other workers have not been able to repeat this work. Dawson and his coworkers working in the Presbyterian Hospital in New York City were unable to find the streptococcus in the blood of his patients with chronic arthritis. Dawson, in his effort to find positive cultures, went into Cecil's laboratory to study in detail Cecil's method of culture. He even went so far as to use Cecil's media and was still unable to find the streptococcus. Hench, at the Mayo Clinic, was equally unsuccessful in finding the streptococcus in his chronic arthritics. These are only a few of the negative reports which have appeared in the most recent literature on chronic arthritis. Coburn, in his book on "The Rheumatic State" reports his work on over four hundred blood cultures from cases of acute rheumatic fever. Coburn used twenty or more different methods of culture and was unable to find a sufficient number of positive cultures to be significant. Cooley, working in the John McCormack Institute in Chicago, reported on his experience in studying the blood of twenty-five children during the acute stage of their first attacks of rheumatic fever. He used Clawson's method and was unable to find the streptococcus. I also have made cultures from the blood of thirty children with subacute rheumatic fever and have been unable to find the streptococcus. From this superficial and incomplete review of the most recent literature on the bacteriology of "rheumatism" it can be concluded that the streptococcus nor any other organism has been proven to be the etiologic agent in either chronic arthritis or rheumatic fever.

Students of this subject have long wondered exactly what significance the agglutination reaction had. Was it a specific action and did it indicate increased immunity? It must be remembered that the use of intravenous vaccine is based on the agglutination reaction. As has been shown, the agglutination titre went up in the treated patients and especially in those patients who had a favorable response. Tillets and Abernathy, working in the Johns Hopkins Hospital, have recently reported on some most interesting work which would indicate that the agglutination reaction is neither specific nor does it indicate increased immunity. They showed that the blood of patients with such variable infections as pneumonia, typhoid, undulant fever, tuberculosis, lung abscess, etc., showed a fairly high agglutination titre to the streptococcus hemolyticus. They further showed that the agglutination reaction went up during the acute febrile stages of many diseases and as the acute stage receded the titre went down. The agglutination titre went along with the sedimentation rate of the red blood cell. They concluded, with Reiman, that the agglutination reaction had something to do with the viscosity of the blood, that it is not a specific reaction and did not necessarily indicate increased immunity. So that it may be concluded that at the present time the agglutination reaction has not been proven to be specific nor that it indicates increased anti-body formation.

It has been claimed that all types of rheumatic infection are the same, the only difference being in the age response of the patient; that is, when a child is infected with rheumatism he develops rheumatic fever, that a young adult has atrophic arthritis, and that old people have the osteo-arthritic type of the disease. Surely from a clinical point of view these three types of "rheumatism" are distinctly different. I am quite sure that any student of this disease could walk through a ward and easily differentiate these different types. It is true that there is some overlapping, but for the most part they present quite distinct clinical pictures. There is anything but agreement on this phase of the subject. Cecil, Pemberton, the English investigators, Osgood and many others oppose the point of view that all types of rheumatism are part of the same disease.

Nicholls and Stansby, working with Cecil, have used the agglutination reaction to differentiate between atrophic arthritis and osteo-arthritis. They found a very high agglutination titre in the atrophic type and a very low titre or no agglutination in the osteo-arthritic type. And yet some investigators have found as high a percentage of positive blood cultures in the latter type as in the atrophic arthritides. Here again is a controversy, an unsettled and unproved phase of the problem.

In regard to the last point, many forms of treatment give arthritic patients temporary relief. Typhoid vaccine, peptone, milk, many other foreign proteids, diathermy, etc., have given favorable results in the hands of many practitioners. One should like to compare the present types of treatment. One should like to know how the titre would go after typhoid injections in humans, also after long continued diathermy treatment. I believe that I have said enough to indicate to you that the whole field is in a very unsettled condition, that the etiology of rheumatism is unknown, that streptococcic vaccine is being used only as an experiment and not on proven ground.

Dr. B. J. Clawson (closing): The question of desensitization, I am quite certain from experimental work and from what I have seen in patients, has been overdone and is really more of a theory than of any practical importance.

Of course we certainly would not insist that there is a specific strain of streptococcus that produces chronic arthritis. We do not insist that it is alway streptococcus by any means. I think, however, in most cases the organism is likely to be streptococcus since this organism has been more commonly found than any others.

The question which Dr. Schaaf brought out about recurrences is certainly one to be observed. I think that to observe the patients over a period of two, four, or five years is really the only method we have of being sure we are getting results.

I am glad the subject of foreign proteins was brought up. From the standpoint of immunology I do not think we can show it has any advantage. It has been used, and I would not want to say it has had no advantage in the patient. It does produce a temperature. It warms the patient up and probably helps him, but the method seems to me to be a roundabout way to increase temperature. The typhoid bacillus is extremely dangerous. In my experimental work, I had a great deal of trouble in giving any dose of typhoid bacillus and keep from killing my animals.

Dr. Shapiro's objection to the etiology is justified. We may be wrong, we will admit. However, the streptococcus seems to be the most probable organism if the disease is an infectious one.

I would not say that agglutinins kill. We are studying the mechanism of the actual bactericidal power. I do think agglutinins are an indication that we are developing bactericidal power. We found this to be true in the patient and in the animal.

As near as we can get at it, our experience and experiments point toward the conclusion that the streptococcus is the most probable etiologic factor in most cases of chronic arthritis; that the intravenous method of vaccination is the best method; and that the agglutination reaction is the best indicator we have of the development of the bactericidal properties in the patient's blood.

MASKED MASTOIDITIS*

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MASKED or latent mastoiditis, because of its frequency, its insidious type of development, its lack of the majority of the usual symptoms, is a disease that may present great difficulty in diagnosis.

It would seem that the term "latent mastoiditis" can seldom be applied, for it would imply a period completely without symptoms, and with no advance of the disease process. There is only one case in the series to be considered in this paper which would apparently meet these criteria. Although the type of case considered here has usually been termed latent mastoiditis in the literature, the term "masked mastoiditis," which is occasionally used, seems much the better and covers all those cases of mastoiditis presenting unusual difficulty in diagnosis.

The usual criteria for a clinical diagnosis of acute or subacute mastoiditis, judging from experience at The Mayo Clinic, in order of their frequency, are as follows: 1. There is tenderness over the mastoid process, either diffuse or else localized over the antrum, with a history of infection of the upper part of the respiratory tract, and apparent subsequent extension to the mastoid cells. 2. The soft tissues over the mastoid process are red and edematous. 3. There is drooping or sagging of the posterosuperior wall of the external auditory canal at its juncture with the tympanic ring, and the "dripping drum" described by Kerrison. 4. There is discharge from the external auditory canal, prolonged beyond the usual time of resolution of acute otitis media, which reappears immediately on being wiped away, as though coming from a large reservoir. 5. A fluctuating swelling appears in the mastoid region; namely, over the mastoid process, in the neck below the tip of the mastoid process, or above and anterior to the ear, over the root of the zygoma. 6. Lancinating pains are referred over the occiput, along the zygoma, into the neck or into the eye, and are more marked at night, tending to disturb sleep. 7. Continued fever, often septic in type, is present.

These symptoms and signs may appear alone, in sequence, or in combination, and in the usual case of mastoiditis I have found at least two present even in the earlier stages.

After a review of the literature, it may be said that the principal signs and symptoms of latent or masked mastoiditis given by the various authors are as follows: 1. There is preceding infection of the upper part of the respiratory tract, with usually some symptoms of disease of the middle ear, separated in time from the appearance of symptoms referable to the mastoid process to a greater or lesser extent. 2. Great emphasis is placed by several writers on the general appearance of the patient, who loses weight, is weak, and is without appetite. There is also an almost unique expression of apathy. 3. Fever is often present, which may be intermittent or of the continued type. Some of the patients had been treated for several months for typhoid fever before a sudden discharge from the ear called attention to the true pathologic process present. This mistake was made previous to the general use of the agglutination test for typhoid fever. 4. Lancinating pain is referred to the occiput, along the zygoma, into the neck and into the temporal region. 5. There is drooping or sagging of the posterosuperior wall of the external auditory canal. 6. A tendency is present for impairment of hearing to be pronounced because of involvement of the inner ear.

STUDY OF CASES

All the cases of acute and subacute mastoiditis in which operation was performed in the clinic from 1920 to 1930 were studied. In all, 585 cases were reviewed. These cases included all complications of mastoiditis such as meningitis, sinus thrombosis and embolism.

From the 585 cases, forty-one were selected which seemed to meet the criteria which would allow them to be distinguished from the ordinary case, a percentage of slightly more than 7 per cent.

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*From the Section on Otolaryngology and Rhinology, The Mayo Clinic, Rochester, Minn. Abridgment of thesis submitted to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science in Otolaryngology and Rhinology, February, 1932.

Only cases which presented difficulty in diagnosis were selected. The signs and symptoms, when they appeared, were those less frequently associated with diseases of the mastoid process and were, therefore, not immediately associated with the underlying cause. The symptoms of mastoiditis gave such little subjective discomfort to the patients that they did not seek medical attention until some complication of mastoiditis had occurred. No case has been included in which there was not an interval of at least a month between any symptom of mastoiditis other than an occasional pain in the affected side, and the probable primary infection of the upper part of the respiratory tract.

It was thought that if the patients were considered according to the chief complaints with which they presented themselves, the difficulty presented in making a definite diagnosis in this condition would be emphasized.

Swelling over the mastoid region.—Typically, the patients who gave swelling in the mastoid region as their chief complaint, had been previously unaware that a pathologic process was present anywhere in their bodies, although usually their appearance suggested the presence of the infection. Only after the appearance of the mastoid swelling did any subjective symptoms of pain in the head, feeling of ill health, or sign of discharge from the ear begin. Two cases illustrative of this type of asymptomatic mastoiditis are as follows:

Case 1. A man, aged twenty-six years, came to the clinic with the history that three months previously he had had an attack of influenza which had confined him to the hospital. One month later, without obvious cause, he had had a severe pain in the left ear, and the membrane had ruptured spontaneously in three days, with relief of the pain. The discharge had continued for about two weeks and then had ceased. About one month later, a week before admission at the clinic, he had noticed pain in the left mastoid region, soon followed by a rather rapidly increasing swelling which had begun to subside again after three days.

Examination of the ear and nose disclosed that the left tympanic membrane was slightly full, with a generalized pink blush. There was concentric narrowing of the external auditory canal, with slight drooping of its posterosuperior wall. The tissues over the left mastoid were moderately edematous and there was exquisite tenderness to firm pressure over the entire left mastoid process. There was bilateral deafness of the stapes fixation type, more marked on the left than on the right. General examination revealed nothing of importance. In a roentgenogram of the mastoids there was cloudiness on the left, graded 4 on a basis of 1 to 4. A diagnosis was made of mastoiditis, with beginning subperiosteal abscess on the left, and mastoidectomy was advised.

At operation, on uncovering the mastoid cortex, a perforation was found below and behind the external auditory canal. At the first stroke of the gouge, pus welled up under pressure. A large cavity full of pus, and infected granulations were found. The diseased tissue extended down to the sigmoid sinus, which was uncovered, and its surface was found to be thickly covered with granulation tissue. The antrum lay high, was deeply situated and small, and some difficulty was experienced in uncovering it. The mastoid cells were completely exenterated, the wound was closed in the usual manner, and myringotomy performed.

Convalescence was uneventful and the patient was dismissed in four weeks, with the ear completely healed.

Case 2. A man, aged thirty-six years, gave the history of the onset of complete deafness in both ears, without any apparent cause, four months before he presented himself for examination. He had consulted his local physician who had treated him with tubal inflation and nasal lavage, with relief of his complaint. A month following cessation of treatment, the patient had noticed painless swelling over the right mastoid region. He had felt run down and feverish but had been free of other symptoms. The swelling over the right mastoid region had gradually increased until about one month before he had come to the clinic. At that time, he had tasted something in his mouth, and had discovered that it was bloody pus. After this occurrence, the swelling had disappeared almost completely, but then had gradually reappeared.

On examination of the ears, nose, and throat, a firm, fluctuant mass was found over the right mastoid and upper cervical regions. The right tympanic membrane appeared slightly opaque and did not move freely with the otoscope. There was slight deafness, of conduction type, on the right side; hearing on the left side was normal. There was a small mass of granulation tissue in the right Rosenmüller fossa. In roentgenograms of the mastoids there was moderate, diffuse cloudiness on the right, with some air-filled cells present. General examination revealed well compensated mitral regurgitation, but otherwise results were negative. The diagnosis lay between malignancy of the nasopharynx and latent mastoiditis. The report on a specimen for biopsy, taken from the right fossa of Rosenmüller, was "inflammatory tissue." Exploration of the mastoid was advised.

At operation the periosteum separated with difficulty, and a well marked petrosquamous groove was present. The superficial cells of the mastoid were involved only a little, but on removing the tip, considerable pus was found under pressure. When pressure was exerted on the neck, pus welled up from below the sternomastoid muscle. A well developed petrosquamous lamina was found and the antrum was deeply situated and apparently below it. The cells in the antro-apical groove were filled with pus and infected granulation tissue. The mastoid was completely exenterated and closed in the usual way. A drainage tube was placed in the cervical abscess and myringotomy was performed. In a culture from the mastoid, taken at the time of the operation, growth of a hemolytic streptococcus was obtained.

Convalescence was without incident, the wound was completely healed, and the patient was dismissed in four weeks.

The exciting cause of the mastoiditis in Case 2 was doubtless insufflation of the eustachian tube. The somewhat unusual type of cellular development of the mastoid probably played a part in concealing the symptoms.

It is probable that a case in which the chief complaint is swelling in the region of the mastoid should offer but little difficulty in diagnosis. However, when it is considered that mastoiditis was present at least a month before this sign appeared, and that there was very extensive destruction of the mastoid process in all cases in which this was the complaint, it is obvious that the diagnosis was completely concealed for a very considerable period, and that the connection between the sign and the causative disease might not be immediately apparent to one not especially concerned with otology.

Lancinating pains.—The cases in which lancinating pain was the chief complaint were all of long standing, and at operation the disease was found to have extended to the dura of the middle fossa, or of the sinus. The pain, typically, was much increased during the night and prevented normal rest. This phenomenon is probably due to the tendency of the intracranial pressure to increase during sleep, and thus for any dural irritation which may be present to increase. The pains are probably referred by the dural branches of the fifth nerve to the sympathetic connections, as described in the recent papers by Temple Fay. Two cases illustrative of this particular syndrome are presented.

Case 3. A man, aged fifty-two years, presented himself with the history that four months previously, he had had a discharge from the right ear which had lasted four days. There had been no preceding earache, or any illness which could be assigned as the causative factor. A month later, the same sequence of events had occurred, and from this on the patient had noticed slight deafness of the right ear. Two weeks before coming to the clinic, the patient had noticed a slightly tender swelling over the posterior portion of the right mastoid, and a lancinating type of pain over this area, referred forward into the temporal region; the pain appeared usually at night, but was slightly noticeable whenever the patient was unoccupied. The patient also stated that he had not felt well for six months, and had been exceedingly sleepy for more than a month.

On examination, the right tympanic membrane was found reddened and bulging, with landmarks obscured. There was no drooping of the posterosuperior wall of the external auditory canal. There was tenderness to firm pressure over the region of the emissary vein of the mastoid, and slight edema of the soft tissues in this region. There was deafness of stapes fixation type on the right side. The remainder of the examination of the ears, nose, and throat gave negative results. General examination also gave negative results, except for a moderate degree of secondary anemia and an increase in the number of leukocytes to 9,000 in each cubic millimeter of blood. In a roentgenogram there was cloudiness of the right mastoid, graded 3.

A diagnosis of latent mastoiditis with probable parasinous abscess was made and mastoidectomy was advised. At operation, the cortex was found markedly sclerotic, and on removal of the first chip, pus welled up under pressure. The mastoid had been converted into a cavity filled with granulation tissue, and the dura of the middle fossa and the sigmoid sinus were uncovered over a wide area. The dura, where it was exposed by the disease, was covered with a thick layer of infected granulation tissue. The mastoid was completely exenterated, the tip was removed, and the dura was uncovered until tissue that appeared healthy was reached. Closure was made by the usual method, and myringotomy was performed. From material taken at operation from the mastoid wound pneumococcus, Type 3, grew in pure culture.

Convalescence was uneventful. The wound was completely healed, and the ear was dry at the end of three weeks.

Although the pneumococcus Type 3 was present, the course of the disease and the postoperative recovery followed the course usually seen in mastoiditis of long standing with the natural barrier to disease well established.

Case 4. A man, aged fifty-one years, gave the history that four months before admission at the clinic, without ascertained cause, a discharge from the left ear had begun. Discharge had continued for two months, and slight soreness of the mastoid occasionally had been present. The discharge then had stopped, and the patient had been free of symptoms for two months. At that time he had begun to have pain over the mastoid, with radiation of the pain to the parietal and occipital regions occurring usually at night and requiring sedatives for relief. Two days before he came to the clinic, he had noticed a slight discharge from the left external canal.

The left membrana tensa was found to be dull red, and no motion could be produced with the pneumatic otoscope. There was no mastoid tenderness. Deafness of stapes fixation type was present and equal on each side. Examination of the fundus gave negative results. In a roentgenogram of the mastoids there was moderate cloudiness in the region of the cells on the left side. The patient was kept under observation for a week, and all symptoms disappeared completely. He was dismissed, but was advised to return if there was a recurrence of symptoms.' He returned in two weeks, reporting that for a week he had had lancinating pains radiating over the left occipital and parietal regions.

Examination revealed slight bulging of the membrana tensa of the left ear, and there was slight tenderness on deep pressure over the mastoid emissary vein. Another roentgenogram of the mastoid was taken, and disclosed marked increase in cloudiness of the cells. General examination was negative, except for mild hypertension. A diagnosis of masked mastoiditis was made and mastoidectomy was advised.

The mastoid cortex was found to be very thin and the mastoid cells were extensively broken down and filled with pus and infected granulations. The disease had extended down to the sigmoid sinus, in the region of the lower turn, and the wall of the sinus was covered with granulation tissue. The mastoid was completely exenterated and closed in the usual manner, and myringotomy was performed. Culture of the mastoid wound was not made.

The patient had no febrile reaction after the operation and was dismissed in three weeks with the wound completely healed. There was nothing in the anatomic structure of the mastoid, as found at operation, to suggest a cause for lack of the usual symptoms.

General weakness.—Two patients presented themselves with no other complaint than that of general weakness. However, a generally run down appearance was characteristic of all patients with masked mastoiditis, sufficiently so, it seemed, to be of definite diagnostic significance.

Case 5.—A man, aged forty-four years, gave the history that a month previously, following an intranasal operation, he had had considerable pain in the left ear; the tympanic membrane had been incised, and a discharge had come from the canal for a day or two. He had noticed nothing further with direct reference to the ear, but a feeling of general malaise had persisted since that time, and he had had a chill, with fever, ten days before his admission at the clinic.

The patient appeared to be below normal physically, and his face had a drawn, anxious look. There was some constriction of the external auditory canal, with marked drooping of the posterosuperior wall, at the juncture of the external auditory canal with the tympanic membrane. Tenderness of the mastoid was not elicited. Deafness of the stapes fixation type was present on the left side. In a roentgenogram of the mastoids there was cloudiness on the left, graded 1. General examination gave essentially negative results.

At operation, the intercellular structures were not broken down but the cells were very large and filled with pus and infected granulation tissue. Over the lower knee of the sinus there was a parasinous abscess. The sinus was uncovered until dura of normal appearance was reached in all directions. The wound was closed in the usual manner, and myringotomy was performed. From material taken at operation from the mastoid wound a hemolytic streptococcus grew in pure culture.

The very large size of the mastoid cells was thought a possible explanation of the lack of symptoms. The patient was dismissed at the end of four weeks with the wound completely healed.

Case 6. A man, aged sixty-two years, presented himself with the chief complaint of loss of appetite, weight, and strength. A month previously, he had had a severe cold, and at about the fourth day he had noticed impairment of hearing on the left side. He had had a slight pain in the left ear, which had been present occasionally since. The deafness had persisted to the time of admission. There was no aural discharge.

On examination, several furuncles were found in the canal of the left ear, but except for slight dullness, no change was noted in the tympanic membrane. Otherwise, examination of the ears, nose, and throat and general examination gave essentially negative results.

The patient came for observation and treatment at irregular intervals, and at the end of a month the furunculosis of the canal had completely disappeared, and the general condition had markedly improved. A month later, however, the patient returned with a discharge from the ear which had been present two days, and he complained of pain in the left side of his head, of a throbbing type, which characteristically was much worse at night, disturbing rest. At the end of a week, slight tenderness appeared on deep pressure over the mastoid antrum.

In a roentgenogram of the mastoids there was slight clouding of the outlines of the air cells on the left, graded 1. Because of the patient's age, the long history, and the nocturnal pain, exploration of the left mastoid was advised.

On uncovering the cortex, generalized petechial bleeding was encountered. The cortex was thin, particularly so for a man aged sixty-two years, and on removing the first chip, pus under pressure welled up, apparently from the region of the upper knee of the sigmoid sinus. The mastoid was cellular and very extensive. The mastoid cells were completely exenterated, the involvement being particularly marked in Trautman's triangle and the root of the zygoma. The upper knee of the sigmoid sinus was uncovered, and the wall was found to be thickened, but as there had been no apparent symptoms of involvement of the sinus it was not further disturbed. A pack was placed in the mastoid, the wound was closed in the usual manner, and myringotomy was performed. From material taken at operation from the left mastoid, Diplococcus pneumoniæ, Type 3, grew on culture.

The patient's course was without incident for five days, and on the fifth day the pack was removed from the mastoid. A 9 P. M. on the sixth day, the patient's temperature rose to 102° F. and he complained of pain in the region of the mastoid wound, and on deep respiration, in the right posterior aspect of the thorax. There was dullness to percussion at the base of the right side of the thorax, and in the axilla. A diagnosis of acute pleurisy was made and the thorax was strapped. The patient had a vivid impression of impending dissolution previous to the operation, which had persisted through his convalescence, but until the appearance of the pleuritic pain there had been no objective intimation of trouble. The patient failed rapidly and died on the seventh day after operation, apparently of acute cardiac failure. Permission for postmortem examination was refused.

It seems possible that wide uncovering of the sigmoid sinus in this case might have revealed involvement of its interior, particularly at the region of the bulb. Judging from the rapidly fatal course, it seems probable that pleurisy was secondary to septic infarction of the lung. This was an early case in the series, and thorough exploration was not practiced then as at present. Cases 5 and 6 were especially striking in that only after close questioning could a history of previous trouble with the ear be elicited.

In the following case, the only one of its type in the group, the patient presented himself with the history of an earache and running ears, and while he was under observation at the clinic a masked type of mastoiditis developed, but the diagnosis of this was not made for about two months.

Case 7. The patient was a man, aged forty years, who presented himself with a bilateral earache of four days' duration, which had come on in the course of an acute attack of coryza. On examination, both tympanic membranes were found to be perforated, and there was a moderate amount of discharge in both external auditory canals. A large solitary polyp was found blocking the left nasal cavity. After ten days, inhalation of steam and rest in bed, the condition of both ears apparently cleared up without difficulty. A week later, the large polyp in the left nasal cavity was removed, without untoward reaction.

The patient returned to the clinic in a month and a half with the complaint of pain which had been present in the left ear for four days. The tympanic membrane of the left ear was slightly red, but not bulging. Tenderness of the mastoid was not elicited. Under observation for two days the condition apparently cleared up, and the patient was dismissed.

In two weeks, the patient returned, with the complaint of renewed aching which had been present in the left ear for two days. On examination, the left tympanic membrane was moderately red. There was concentric narrowing of the external auditory canal on the left side. Slight edema existed over the left mastoid, and there was moderate tenderness on deep pressure at a point overlying the antrum. Examination of the ears, nose, and throat was otherwise negative. General examination gave no positive findings. A roentgenogram of the mastoid regions appeared to represent a normal condition on the right, but there was a large area indicative of absence of bone on the left, which was thought to represent complete destruction of the interior mastoid process.

At operation, on incising the soft tissues, pus escaped from the upper end of the incision, and the tract appeared to lead to the posterosuperior wall of the external auditory canal. The mastoid cortex was sclerotic, and there was eburnation of the tip. There was a cavity in the upper portion of the mastoid, 2.4 cm. in diameter, filled with infected granulations; the disease extended down to the upper turn of the sigmoid sinus and to the dura over the temporal lobe. The antrum, small and deeply situated, was found with some difficulty. The sinus and the dura of the middle fossa were uncovered in all directions, until tissue of normal appearance was reached. The wound was closed in the usual manner, and myringotomy was performed.

From material obtained from the mastoid wound Diplococcus pneumoniæ, Type 3, grew in pure culture.

Convalescence was uneventful and the patient was dismissed in four weeks with the canal of the ear dry and the postauricular wound healed.

The sclerotic condition of the mastoid suggested the possibility of previous infection of the process, but no history confirming this supposition could be elicited. It is possible that the degree of sclerosis observed might have been produced during the two months the disease was present. The apparent great destruction of the mastoid that was shown in the roentgenogram was not found at operation. Untoward effects were not produced by closure of the wound over a pack, in spite of the presence of the pneumococcus, Type 3.

Continued fever.—Perhaps the most bizarre case in this series was one which was referred to the clinic. This was the only case in this series in which the chief complaint was of continued fever; it was the only one in which the disease was bilateral, and, in our experience, it was the only one which seemed to present true latency. It will now be reported.

Case 8. A woman, aged twenty-two years, stated that one year previous to admission she had had a severe case of scarlatina complicated by quinsy, and she had been under quarantine for four weeks. She had returned to her work after a month, but had felt weak and had tired easily. After working for about one month, she had begun to run a continuous temperature of 102° to 104° F., but without localizing symptoms. The fever had subsided in three to four weeks and she had felt perfectly well. Six months later, she had had a chill, followed by a continuous temperature of 104° F. but no obvious cause could be found. After three months, she was referred to the clinic.

At the time of the patient's admission, her temperature was 101° F. and she appeared very ill. General examination gave negative results. She was immediately hospitalized, and agglutination tests made for typhoid fever, tularemia, and infection with Brucella melitensis, variety abortus, were found negative. Blood smears taken for infestation with protozoa, and a blood culture, were negative. On repeated analysis, the urine was normal.

The patient was then sent for examination of the ears, nose, and throat, with the thought that symptomless sinusitis might be responsible for her condition. On examination, the left membrana tensa was found to be slightly reddened, and there was slight bulging in the region of Shrapnell's membrane. Slight tenderness was noted on deep pressure over the tip of the left mastoid process. Slight redness along the handle of the malleus on the right was noted. Otherwise, examination of the ears, nose, throat, nasopharynx, and larynx did not reveal a pathologic condition.

After close questioning, the patient recalled that on three or four occasions in the six months just passed, she had noticed a rather peculiar interference with her sense of hearing in the course of choir practice. This was the only history obtainable with reference to the ears. A tentative diagnosis was made of latent mastoiditis and the patient was observed further. Roentgenograms of the mastoids and sinuses were negative. The redness of the left membrana tensa gradually increased, and bulging was apparent. Myringotomy was performed four days later, and this was followed at first by a serous discharge. Because of the almost symptomless advance of the condition, suspicion arose that the condition might be due to presence of organisms of tuberculosis, and material was taken for inoculation of guinea pigs. On killing the pigs five weeks later, no evidence of tuberculosis was found. The discharge from the right ear became more pronouncedly purulent, and tenderness of the mastoid more acute. Another roentgenogram of the mastoids disclosed that the outline of the mastoid cells on the left side was slightly cloudy. Four days after myringotomy, drooping of the posterosuperior wall of the external auditory canal was noted. However, the discharge from the ear began to decrease and the tenderness of the mastoid gradually lessened. Since the continued fever showed no signs of remission, and drooping of the superior wall of the external auditory canal persisted, a definite diagnosis was made of latent mastoiditis, and mastoidectomy was advised.

At operation, the left mastoid was found to be extensive, and of the small-celled variety. The cell-walls were sugary, and the cells were filled with granulation tissue which bled easily, but the septums were not broken down. The antrum was easily found and was seen to be filled with granulation tissue. No frank pus was obtained, although the mastoid cells were completely exenterated. The sinus was purposefully uncovered but was in normal condition. Material was taken from the mastoid wound at operation, and a hemolytic streptococcus grew on culture. Transfusion of 500 c.c. of citrated blood was given the day following the operation in an effort to combat the patient's marked anemia.

The fever did not subside after the operation, although blood cultures were repeatedly negative. Gallop rhythm was noted at the apex of the heart, and the presence of malignant endocarditis was suspected. The condition of the mastoid wound continued to be very satisfactory in appearance. The ocular fundi were negative, and neurologic examination did not give any positive findings. Transfusion of blood was repeated with no observable effect.

Ten days after the mastoidectomy, a whitish, necrotic area appeared in the posteroinferior quadrant of the right membrana tensa. The hearing in the ear was normal to the whispered voice and to the tick of a watch. There was increase in bone conduction, although the hearing as tested by tuning forks of both high and low pitch was not decreased. The following day, slight redness of the right membrana tensa, with some bulging confined to the posterior quadrant, was found, but the anterior portion appeared normal, except for engorgement of the surface vessels.

Myringotomy was done on the right side, and pus escaped under marked pressure. Following this, there was a slight fall in the temperature, but in two days the temperature returned to its usual level of 102° to 130° F. On inspection, no drooping of the posterosuperior wall of the right external auditory canal and no tenderness of the mastoid were noted. Due to the similarity of events with reference to the two ears, however, exploratory mastoidectomy was advised.

At operation the same type of mastoid was found as on the other side, but with much more marked breaking down of the cells, which contained a quantity of pus. The cells extended posteriorly to the sinus, and on the posterior aspect of the wall of the sinus a parasinous abscess was found. In removing the bone over the abscess, the sinus was accidentally opened, but bleeding was controlled by a pack. The mastoid was completely exenterated, the wound packed in the usual manner, and myringotomy performed. A culture made of material taken from the mastoid at operation contained a hemolytic streptococcus. Transfusion of 500 c.c. of citrated blood was given immediately following the operation. The temperature returned to normal, remained so for a week, and the wound on the left side healed completely. On the evening of the seventh day after the operation on the right side, the patient complained of severe occipital headache. The pack over the sinus was immediately removed, but the sinus appeared in good condition. The dressing was followed by a rise in temperature to 101° F. but this subsided again on the following day. The patient became drowsy, and four days later complained of double vision. Examination of the eyes revealed bilateral weakness of the external rectus muscles, and examination of the ocular fundi disclosed bilateral choked disks of 2 to 3 diopters, with hemorrhages and exudate.

The amount of discharge from the canal and postauricular wound suddenly increased, and drainage was profuse, with simultaneous improvement in the patient's symptoms and subsequent fall in the temperature. It was thought that an epidural abscess was present which had begun to discharge, with consequent release of pressure. However, neither the discharge nor the patient's improvement continued. Slight rigidity of the neck developed, the weakness of the external rectus muscles became even more marked, and the bilateral choking of the disks increased to 4 diopters. Neurologic examination revealed nothing but hyperactive reflexes on the left side. Because of the possibility of the presence of a brain abscess, spinal puncture was not done. Drowsiness increased and occipital pain became more marked.

One month after the second operation, the patient complained of a sensation of numbness in both arms. No deep reflexes could be elicited on neurologic examination. Discharge from the canal had disappeared and the postauricular wound was healed. The patient's condition remained stationary, and it was decided to explore the right temporal lobe.

Exploration was made through a subtemporal opening but pus could not be found. However, on opening the dura, cerebrospinal fluid escaped under marked pressure. Following this, the patient's condition steadily improved, the choked disks and the palsy of the external rectus muscles disappeared. The patient was dismissed in a month after the decompression, with all neurologic signs approaching the normal.

The period of absence of signs and symptoms referable to the ear was a full year from the time of the probable introduction of the organism responsible. The organism must have remained in the mastoids for considerable time, during which the relationship of microörganism and patient must have been one of virtual symbiosis. It is difficult to be certain whether this is an evidence of low virulence on the part of the invading organism or of unusual powers of resistance on the part of the host. There was nothing unusual about the anatomy of the mastoid to account for the condition, and the organism found in both mastoids was a hemolytic streptococcus. This case also illustrates very well the fallacy of depending on roentgenographic findings for diagnosis.

COMMENT

Eleven of the patients were women and thirty were men. The average age of the patients was thirty-seven years; the youngest patient was seven years and the oldest, sixty-seven years. In twenty-four cases the left mastoid region was affected; in sixteen, the right, and in one, both right and left. In all the cases, a history of previous disease of the middle ear or of infection of the upper part of the respiratory tract could be obtained. The average length of time from the primary infection, until a diagnosis of mastoiditis was made, was three and one-tenth months; the longest time was twelve months, and the shortest, one month.

Patients presented themselves with various chief complaints. Swelling over the mastoid process was present in nineteen cases. Lancinating pain was the chief complaint in fourteen cases. This symptom appeared sooner or later in the majority of cases in which extensive dural involvement was found at operation. Dull pain in the affected side was the chief complaint in three cases; generalized weakness in two cases; tinnitus and deafness in one case; continued fever in only one case, and recurring earache in one case.

There were eighteen cases in this series in which cultures of the mastoid wound were made at operation under sterile precautions. A pure culture of organisms was secured in each instance considered. Of these, it was found that in four cases the staphylococcus was the causative organism; in eight cases, a hemolytic streptococcus, and six cases, the Diplococcus pneumoniæ, Type 3.

That there is an anatomic factor tending to produce mastoiditis of a comparatively symptomless type, seems probable. At operation in eight cases, marked sclerosis of the mastoid cortex was found. In these cases the patients were in the fourth decade of life or beyond. There were twelve cases in which a well developed petrosquamous lamina was found. In fourteen cases, there was such marked destruction of the mastoid process by the disease that no conclusions as to the influence of the anatomic structure on the course of the disease could be drawn. There were six cases in which the structure of the mastoid apparently played no part in the production of unusual symptoms.

Drooping of the posterosuperior wall of the external auditory canal was found in twenty-four cases and no suggestion of drooping could be discovered in seventeen. Tests of hearing were not of marked diagnostic importance. Tenderness over the mastoid process was usually not present until very late, and often could not be elicited.

Complications.—In eighteen cases there was parasinous abscess, and in four, in addition, epidural abscess. Extension to the interior of the jugular vein occurred in only one of these cases and there were no instances of intradural extension except as noted in Case 8. Characteristically, the meninges were covered with a very thick layer of granulation tissue which seemed adequate to prevent further extension of the disease.

Extension of the disease to the dura over the sinus, or over the middle fossa, in this type of mastoiditis at least, is not of itself of serious prognostic significance. Of great significance, however, is operative exposure of involved meninges until tissue of normal appearance is reached. A point of technic, suggested by Lillie, and that should be particularly stressed, is that sufficiently wide exposure of the dura be made to allow the intracranial pressure to tampon the dura down into the region of dehiscence, thus preventing seepage to uninvolved areas.

Fatalities.—Three of the forty-one patients with masked mastoiditis died, giving a mortality rate of 7.3 per cent, as compared to a mortality rate of 3.2 per cent for the whole series of 585 cases of acute and subacute mastoiditis including complications. Of the three cases mentioned, one has been presented in full (Case 6). Another patient with probable labyrinthitis had nausea and vomiting associated with transient attacks of vertigo for three days before admission, and complete nerve deafness was noted at examination. The labyrinth was not drained at the operation. The patient died of purulent meningitis the third day following the operation. The labyrinth was not examined postmortem. Still another patient with bilateral thrombosis of the cavernous sinus was seen three months after the probable initiation of the disease. He had slight rigidity of the neck when first seen, and although immediately operated on, he died of purulent meningitis the third day after operation. Additional findings at necropsy were extensive osteomyelitis of the bones at the base of the skull, including the body of the sphenoid bone, and the sphenoid sinuses were filled with pus. There was also a septic thrombus in the superior petrosal sinus on the side of the mastoiditis.

All of the deaths occurred in cases in which the Diplococcus pneumoniæ, Type 3, was present. However, in the uncomplicated cases in which this organism was present and in which complete exenteration of the mastoid was done, no variations from the normal course of recovery were seen. Therefore, it may be concluded that although the Diplococcus pneumoniæ is an organism of the greatest virulence, no alterations in technic are necessary in its presence. In the two cases which offered possibility of cure preoperatively, it may be argued that if a more extensive operation, completely fulfilling the requirements of free drainage of all infected foci, had been carried out, the chance of survival would have been greatly enhanced.

CONCLUSIONS

1. Masked mastoiditis occurs with sufficient frequency to make its recognition of significance (slightly more than 7 per cent of all cases of acute and subacute mastoiditis).
2. Masked mastoiditis may present the greatest difficulty in early diagnosis.
3. There is no single sign or symptom of unique diagnostic significance in this disease.
4. Anatomic factors seem to be of significance in producing some cases of this disease.
5. Other organisms than the Diplococcus pneumoniæ may produce insidiously advancing mastoiditis.
6. The technic of mastoidectomy does not need to be varied according to the bacteriologic findings.

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MODERN ASPECTS OF THE SURGICAL TREATMENT OF UROGENITAL TUBERCULOSIS*

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THE past few years have witnessed a changing attitude on the part of the medical profession concerning the surgical treatment of tuberculosis of the urogenital system.[1] This has come about as the result of careful clinical studies of the earlier stages of urogenital tuberculosis and the use of this information in the medical and surgical treatment. The pathological and experimental aspects of the earlier lesions have been thoroughly studied by Medlar,[3] and Medlar and Sasano.[2] In previous communications[4] we presented the results of clinical studies of large numbers of tuberculous individuals in whom we attempted to discover early lesions of renal tuberculosis and to evaluate these findings in the light of all available experimental and pathological data. In these communications we called attention to the following:

1. Tuberculosis is a constitutional disease, urogenital infection being only a local manifestation.
2. Renal tuberculosis is practically always hematogenous in origin and may be primarily a bilateral implantation.
3. Tuberculous lesions in the kidney may be destructive or inflammatory; the inflammatory lesions may heal.
4. Tubercle bacilli may not be found at all times in the urine of patients with renal tuberculosis.
5. Tubercle bacilli in the ureteral catheterized urine from the kidney pelvis denotes renal tuberculosis.
6. A normal kidney can not eliminate tubercle bacilli so that excretory bacilluria does not occur.

The following report is an attempt to further crystallize the available data concerning the surgical treatment of urogenital tuberculosis.

PATHOLOGICAL ANATOMY OF THE INVASION AND EARLY LESION OF TUBERCULOSIS IN THE KIDNEY

Renal tuberculosis develops from an hematogenous implantation of tubercle bacilli in renal tissue. We have learned to recognize pathologically, anatomically, and by pyelograms, two types of tuberculous lesions in the kidney. One may be inflammatory, non-destructive or only slightly destructive. These are not visualized on the pyelogram. The other, a later stage of the former, becomes an ulcerative or more destructive lesion, which may never heal. These lesions, depending on their size and location, produce various sized filling defects in the pyelogram. They may be divided into ulcerative, which occurs at the tip of a pyramid; parenchymal abscess, the most common lesion; and tuberculous pyonephrosis. Medlar found, after sectioning entire kidneys, that lesions occur more frequently in one zone than in another. He concluded that the site and the size of arterial emobli apparently determines the type of lesion which will result. According to this work the most frequent site of implantation, and, therefore, the most common lesion, is in the cortical zone of the kidney. This lesion begins in a glomerulus[5] or tubular capillary where the emboli of necessity must be small and here abscess formation is almost unknown. These are usually discreet lesions that tend to encapsulate and fibrose but they may coalesce. They do not involve the medulla and infrequently result in the presence of tubercle bacilli in the urine, unless extensive necrosis occurs. The next most frequent site is in the cortico-medullary, or intermediate zone of the kidney, where the blood vessels and emboli are somewhat larger and where necrosis with bacilli in the tubules and in the urine occurs frequently. These lesions start in the region of the arcuate arteries, are usually fan-shaped and have a tendency to coalesce. They spread by way of the tubules and produce the most extensive destruction. The least frequent site of implantation is in the true medullary zone of the kidney where subsequent abscess formation is relatively frequent. These lesions start in the pyramidal vessels or are an infection through a tubule from a destructive cortical lesion. Clinically, we feel that the size and site of infected emboli, plus the constitutional resistance of the patient must, to a considerable degree, determine whether a given patient will develop an inflammatory non-destructive or a destructive type of lesion. If we accept the hematogenous origin of renal tuberculosis, then there certainly must be some determining factor, or factors, such as we have just mentioned, to account for the apparent discrepancy in the incidence of bilateral involvement in the early and late types of lesions. In published reports 70 per cent of all patients seeking relief from cystitis and an extensive destructive type of renal tuberculosis have a unilateral renal lesion, while 30 per cent have bilateral lesions. We doubt the accuracy of these reports because not infrequently the diagnosis is made after only one urological examination. Sixty-five per cent of our carefully studied series of tuberculous individuals presenting the earlier lesions of renal tuberculosis have bilateral involvement. Incomplete diagnosis, marked difference in the age of the two types of lesions and the possibility that frequent complete healing occurs with the early, slightly destructive or non-destructive ones, may explain the numerical difference in bilateral involvement noted. In our opinion excretory bacilluria does not occur; i.e., the normal kidney does not pass tubercle bacilli without the development of lesions of tuberculosis. Involvement of the second kidney in bilateral renal tuberculosis need not be explained by an elaborate process of retrograde extension up the ureter. It is better explained by the subsequent hematogenous extension from lesions already present in the second kidney or from repeated showers of infected emboli having their origin in a focus in the chest.

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DIAGNOSIS OF RENAL TUBERCULOSIS

A genitourinary history in the diagnosis of the early lesions of renal tuberculosis is of little value. The majority of our patients give no history of complaints referable to the urinary or the genital tract. A history that suggests that tubercle bacilli may have entered the blood stream from some lesion in the chest signifies that the kidneys may be infected, or may have been infected. A history of a previous tuberculosis is significant.

Symptoms.—Text book descriptions and statements appearing in published articles, of the first symptoms of early renal tuberculosis are erroneous. Frequent, painful, burning urination with pus in the urine are in fact symptoms of cystitis, a secondary and frequently late complication of renal tuberculosis. Hematuria, which would immediately lead one to suspect the kidney, occurs infrequently with the early lesions. In the majority of early cases a diagnosis of renal tuberculosis is made before symptoms have developed that signify bladder involvement.

Experience gained from the physical examination of normal individuals has revealed that the early lesions of pulmonary tuberculosis may be found in a patient who has no symptoms. This is applicable in the diagnosis of renal tuberculosis so that we begin the search for early renal lesions in patients who have no urinary symptoms. Every physician and surgeon interested in the diagnosis and treatment of tuberculosis should realize that lesions may develop insidiously in the kidney.

Urological Survey.—Repeated complete urological examinations is the best method of determining the presence or absence of ulcerative or destructive lesions of tuberculosis in one or both kidneys. They will determine when surgical treatment is indicated or contraindicated. In our opinion insufficient data obtained during one urological examination are the cause of the high mortality following nephrectomy. This mortality is noted during the first two years after operation and suggests that many patients are operated on when an undiscovered lesion is present in the second kidney and before the surgeon is sure that the patient has sufficient defense against tuberculosis. The chief reason why more bilateral lesions are not discovered is because the patient is not repeatedly examined. Every patient who has had tuberculosis in any form and who has cellular elements in his catheterized urine should be subjected to repeated urological study, providing his general condition will permit. A combined phenolsulphonphthalein functional test and complete blood chemistry studies should be made before cystoscopy is undertaken. Roentgen-ray examination of the entire urinary tract, which is a routine procedure before cystoscopy, has not been helpful in the diagnosis of the early renal lesions of tuberculosis. An old pyonephrosis, or a large destructive lesion which has practically destroyed the kidney, may contain enough lime so that a mottled shadow typical of renal tuberculosis may be obtained. This is not found with the early lesions.

Cystoscopy must be carefully done and the data obtained properly interpreted. Reflux or contamination of the ureteral catheter has been assigned as the cause of the large number of bilateral lesions which we report. Reflux has occurred in 11.5 per cent of all the patients that we have cystoscoped. In a previous paper we called attention to the very careful technic of cystoscopy and ureteral catheterization which we practice. We advised flushing the ureteral catheters with sterile water during their passage through the cystoscope, the bladder and the ureter, together with a test for reflux. This in brief is done by over-distention of the bladder with methyl blue solution after the passage of ureteral catheters, and before the ureteral specimens of urine are collected. If an incompetent ureterovesicle valve is present, methyl blue will pass up the ureter and return through the ureteral catheter. When this occurs it is evident that the specimen is contaminated. This technic should eliminate to a great extent the possibility of contamination of urine specimens or their incorrect interpretation.

Laboratory Data.—During cystoscopy large specimens of urine should be obtained from each renal pelvis. A smear of the sediment should be examined after staining by the Ziehl Neelsen method. If no tubercle bacilli are found the sediment is injected into guinea pigs. The technic of the guinea pig test as we use it has been previously reported. Failure to find tubercle bacilli in smears of urinary sediment from catheterized specimens does not rule out tuberculosis. Tubercle bacili may be present in only one of fifty slides examined. The injection of the sediment into guinea pigs, or culture, are more accurate tests but here negative findings do not necessarily mean that no lesion of tuberculosis is present. We know from experience that the excretion of tubercle bacilli into the urine from a parenchymal abscess is frequently intermittent. In a paper previously published we drew attention to the necessity of the injection of sediments obtained from several weekly specimens of urine, two of which were from twenty-four hour collections, into the same animal so that we might find tubercle bacilli when present in small numbers.

Functional Tests.—Indigo carmine and phenolsulphthalein are of little value in making a diagnosis of the early lesions of renal tuberculosis. When much destruction has occurred from a tuberculous pyonephrosis there may be a definite lessening of the function.

Urography.—We have been criticized because we make repeated bilateral pyeloureterograms in renal tuberculosis. We have made hundreds of pyelograms without observing the spread of tuberculosis into or from the kidney. We have not observed miliary infection or meningitis following, or as the result of, retrograde pyelography. However, this examination should be done very carefully. We try to insert the ureteral catheters so that the eyes are within the renal pelvis and not in a calyx tip or low in the ureter. This encourages complete drainage of the pelvis so that after a measured amount of sodium iodide is injected all of it may be withdrawn by syringe immediately after the film is exposed. Two syringes are always used, which prevents contamination from one kidney to the other and facilitates easy injection. We know of no method of examination that will reveal the presence of tiny macroscopic ulcerative or destructive lesions of the kidney as constantly as the pyelogram. By this method we have been able to find small ulcerative lesions and parenchymal abscesses when a specimen of urine obtained from the same kidney did not contain tubercle bacilli. Repeated bilateral pyeloureterograms are necessary because if only one kidney is examined the surgeon may overlook an unsuspected lesion in the other. The pyelogram has helped to estimate the relative amount of local defense against tuberculosis manifested by the kidney. Repeated pyelographic examination of destructive lesions has taught us that the kidney may develop a local resistance or defense mechanism of considerable degree. If a patient has a good local and general resistance a destructive tuberculous lesion of the kidney may be held in abeyance or progress slowly. When the local defense and the constitutional resistance is slight the kidney may be quickly destroyed. These changes may be accurately followed by pyelography only. There is plenty of time available for careful study of the patient's urinary tract before surgical treatment is undertaken. Except for hemorrhage and an obstructed ureter with pain and toxemia, surgical treatment in renal tuberculosis is never an emergency procedure. Repeated pyelograms reveal that a patient may have a destructive renal lesion of tuberculosis for months, and years, without demonstrable symptoms.

In our clinic the intravenous method of urography has not been particularly valuable. It does not visualize the minor filling defects which may be observed with the retrograde method. This method is useful when it is impossible to cystoscope a patient, or to catheterize both ureters because of an obstruction or stricture. In these instances pyelography would be impossible without the intravenous method.

LOCAL AND GENERAL DEFENSE MECHANISM AGAINST TUBERCULOSIS

Before deciding upon surgical treatment for destructive, unilateral renal tuberculosis the patient's general condition and his resistance to lesions of tuberculosis must be considered. Tuberculous individuals receive constitutional treatment so that they may develop resistance against tuberculosis and thus control their infection. For this reason every patient should have manifested his ability to control this disease before surgical treatment is advised. Although we have never been able to prove that a macroscopic destructive renal lesion of tuberculosis heals completely we have much pyelographic evidence that the development of a very definite local defense may occur. We have observed destructive lesions that did not progress over a period of years. Many specimens examined after nephrectomy contain lesions of tuberculosis that are completely walled off from the rest of the kidney. In many of these we had great difficulty finding other areas of tuberculosis in the good portions of the kidney. The question of resistance against tuberculous infection and the arrest and possible cure of some lesions should be carefully considered before a kidney with a small destructive lesion that does not progress is removed, as much good kidney tissue may be unnecessarily sacrificed.

SURGICAL TREATMENT IN GENERAL TUBERCULOSIS

Among physicians and surgeons there is a lack of understanding regarding the role of surgical treatment in the cure and the arrest of all forms of general tuberculosis. For many years tuberculous patients, particularly those with pulmonary disease, were considered unsuitable subjects for surgical intervention. Many patients so handicapped remained unaided because they were denied the benefits of surgical treatment. Today this attitude has been somewhat modified so that we frequently encounter evidences of overenthusiasm with instances of ill-advised and injudicious use of surgical treatment in this field. The greater one's knowledge of the destructive effect of lesions of tuberculosis, the greater becomes one's respect for its potential possibilities for doing harm. Likewise, the more the physician or surgeon knows about a given individual's resistance against this disease the more intelligently he may be able to plan and direct the surgical treatment.

A rather conservative attitude toward surgical treatment in the tuberculous individual may be briefly summarized as follows: Tuberculosis is primarily a constitutional disease with local manifestations in various organs. It is rarely possible to extirpate all of a given individual's tuberculosis, so that in general it may be stated that surgical treatment does not cure but is an aid in obtaining a clinical result.

Recent or acute pulmonary tuberculosis with the exudative types of lesions presents a very treacherous field for surgical attack, if attempted before the patient has mobilized his powers of resistance. Radical surgical treatment at this time may not benefit the patient but may be the direct cause of a marked exacerbation of the disease which leaves him far worse than before surgical treatment was instituted. The chronic fibrotic stages of the disease offer a safer field for surgical intervention, but here, as well as during the acute stages, the surgeon must recognize that any trauma which greatly lowers the patient's local or general resistance may be followed by a lighting up of an apparently quiescent tuberculous lesion, either locally or in some distant organ. The careful selection of patients, as well as the time of operation, is of paramount importance if surgical treatment is to be undertaken. A very careful surgical technic, which includes gentleness in handling of tissues, the avoidance of shock and unnecessary trauma and careful pre-operative and postoperative treatment, is imperative. The avoidance of anesthetic trauma to the lungs by inhalation anesthesia is necessary because this may reactivate quiescent pulmonary disease. Surgical trauma may be a causative factor in the metastasis of tuberculosis to various portions of the body. Tuberculosis rarely presents indications for emergency operations, so that plenty of time may be taken for complete diagnosis and for the arrangement of conditions most favorable to the patient contemplating surgical treatment. It is a well recognized fact that tuberculous individuals recover from all illnesses and surgical treatment more slowly than others. Postoperatively, therefore, they must be given sufficient time to make complete recovery from their surgical treatment, so that any residual infection or any lesions activated by the surgical manipulations may become quiescent. It is evident that tuberculous individuals require more careful management than average individuals. However, if their special problems are recognized and evaluated it is surprising how much surgical treatment has to offer them. Many of the surgical principles which apply in the treatment of pulmonary and general tuberculosis are applicable in the surgical treatment of urogenital lesions.

TREATMENT FOR UNILATERAL DESTRUCTIVE RENAL TUBERCULOSIS AND THE TECHNIC OF NEPHRECTOMY

Unilateral extensive destructive lesions of renal tuberculosis require nephrectomy but only at a time when the operation may be done with the least danger to the patient. Unilateral and bilateral non-destructive lesions of renal tuberculosis are medical conditions and should have intensive medical treatment. Unilateral slightly destructive renal tuberculosis should be treated conservatively under careful observation. Nephrectomy is indicated only when progressive disease is present.

We use spinal anesthesia whenever it is possible, as it produces no lung irritation, less trauma to the tissues during removal of the kidney, better exposure, and thus more rapid operative procedure.

The fat surrounding the kidney and as much of the ureter as possible is removed. The ureter is incised with an endotherm knife, tied, and the remaining stump injected with pure carbolic acid. The carbolic acid sterilizes the ureter so that it may not become a factor in subsequent infection of the wound, in the production of a sinus, or in continuing infection of the bladder. When the ureter is obviously infected or dilated a hollow tube gutta percha drain is slipped around the cut end of the distal stump where it is held by a chromic gut ligature. This is allowed to remain for at least three weeks. If the ureter is not infected no drain is used. When the ureter is being treated, we are very careful to protect the surrounding tissue from contamination. The end of the ureteral stump attached to the kidney is covered with a small piece of hollow tube drain, so that contamination of the wound may not occur from this source. Drainage of the kidney fossa or the incision is unnecessary.

Close, accurate approximation of the several tissues of the wound should be made with care. Figure of eight braided silk tension sutures embracing all tissue layers, including the fascia and skin, tied over large pearl buttons have been comfortable and satisfactory. These sutures, tied in bow knots so that they may be adjusted at will, may be left in the wound for six to eight weeks.

Re-opening of the incision following nephrectomy for renal tuberculosis occurs in the patient who has little or no resistance, and is the result of perinephritic involvement at the time of operation, contamination of the incision by an accidentally opened ureter or kidney pelvis, rupture of an abscess or, rarely, from a residual tuberculous ureter. If the patient has sufficient resistance, many of these factors will not become operative, so that the wound will heal completely and permanently.

Chronic sinuses that may develop following removal of a tuberculous kidney are excised with the endotherm knife so that complete exposure of all ramifications is attained. Every portion of the wound surface is then thoroughly destroyed with bipolar diathermy. Following this, the wound is packed with sterile gauze without suturing and is repacked and treated with actinic light daily. Aseptic precautions must prevail during the daily dressing of these wounds if secondary infection is to be prevented. If the patient has good resistance against tuberculosis, the wound and sinuses will heal promptly from below upward.

THE TREATMENT OF BILATERAL LESIONS OF RENAL TUBERCULOSIS

As mentioned previously in this paper, we find clinically that 65 per cent of the early lesions of renal tuberculosis are bilateral. Patients may have a macroscopic destructive lesion in one kidney and a non-or slightly destructive lesion in the other. These kidneys should be re-examined repeatedly and frequent urinalyses and pyelograms should be made to estimate the progress of the macroscopic destructive lesions in one kidney, and to search the other for evidence of the development of macroscopic destructive lesions. We have watched a non-destructive lesion in one kidney apparently heal so that we were able subsequently to remove the other kidney containing the destructive lesion. We have observed some patients with bilateral infection develop enough defense mechanism during constitutional treatment so that the lesions in their kidneys did not progress and their bladder symptoms practically disappeared. A number of our bilateral group of patients have returned to work for several years. A patient with bilateral renal tuberculosis, in our opinion, is not a hopeless case. His span of life from the genitourinary standpoint is measured by the available functioning renal tissue present. He must remain under constitutional treatment in a sanatorium until a thorough defense mechanism is built up so that lesions in his kidneys and any extraurinary activity may be controlled. Bilateral renal tuberculosis is usually not a surgical condition. Almost every tuberculous kidney contains some good tissue so that two tuberculous kidneys contain more reserve tissue than one. Occasionally, nephrectomy may be justified when a patient with bilateral destructive lesions has severe pain, hemorrhage, or obstruction of the ureter.

SURGICAL TREATMENT FOR TUBERCULOSIS OF THE LOWER URINARY TRACT

Tuberculosis in the scrotum is usually an infection in the epididymis and vas deferens and not in the testicle. Seventy-five per cent became bilateral. In only an occasional instance are we unable to find clinical evidence of tuberculosis in the prostate with infection in the epididymis. During the past five years, we have been interested in the association of lesions of tuberculosis of the lower urinary tract and the kidney. In only one patient of the last thirty-five were we unable to demonstrate the presence of a lesion in the kidney when tuberculosis of the epididymis was present. This occurred in a man who was discharged from the sanatorium as an arrested case before we were able to completely re-examine him. Wm. M. Spitzer[5] in a recent article states that tuberculosis of the genital tract is probably due in the majority of cases to extension from the upper urinary tract.

Tuberculosis of the epididymis may be a very acute condition, progressing frequently to abscess formation. These abscesses may be aspirated, or drained externally so that the acute process will subside, after which an epididymectomy may be done. Many patients who have had epididymal abscesses drained, plus heliotherapy and constitutional treatment have receovered completely. When operative treatment is indicated, epididymectomy should be done and not castration. The epididymis, together with the vas up to the internal ring, may be carefully resected without destroying the blood supply to the testicle, or the testicle itself.

We have noted during our complete urological examinations and in our autopsy material that tuberculosis of the prostate progresses to abscess formation frequently. These abscesses drain into the urethra and may be the cause of producing pus or tubercle bacilli in the terminal urine. With the cystoscope large dilated infected prostatic ducts and abscess cavities may be seen. Associated with abscess of the prostate we have encountered extensive ulceration of the bladder out of proportion to the renal lesions present.

CONSTITUTIONAL TREATMENT OF UROGENITAL TUBERCULOSIS

The constitutional treatment of tuberculosis, *i.e.*, rest and heliotherapy, should be given both before and after surgical treatment. This enables the patient to arrest any residual infection by keeping up his resistance. In the sanatorium, any patient who submits to any type of surgical treatment is required to remain in bed, at rest, with heliotherapy when possible, from one to six months following operation. This is a good rule for patients who are not residents of a sanatorium, but it may be varied according to the patient's manifested resistance, his temperature, and general condition after the operation. Every patient with urogenital tuberculosis should know that he is suffering from a general disease, and that the removal of his kidney alone may not cure him. He should be told that the cure of tuberculosis is achieved only by the patient himself, and requires time and patience. In the management of urogenital tuberculosis, treatment should be directed at the patient as a whole, not the local lesion alone. Bed rest and heliotherapy after operation applies particularly to the patient who has remaining lesions of tuberculosis, such as cystitis. We have observed many patients with very severe tuberculous infections of the bladder return to normal during careful hygienic treatment.

CONCLUSIONS

1. The successful surgical treatment of urogenital tuberculosis depends primarily upon an accurate diagnosis. This may be accomplished only after repeated complete urological examinations.

2. Surgical treatment for any type of tuberculosis, except in an emergency, should not be undertaken until the patient has developed a sufficient defense mechanism.

3. The surgical treatment of urogenital tuberculosis is rarely an emergency.

4. Surgical or medical treatment of tuberculosis should aim at the patient as a whole, not alone at the local lesion.

5. Renal tuberculosis or other urogenital lesions are local manifestations of a constitutional disease.

6. Non-destructive renal tuberculosis, unilateral or bilateral, is a non-surgical condition and should be treated intensively by medical methods.

7. Tubercle bacilli in one specimen of urine obtained from the kidney pelvis is not in itself an indication for nephrectomy.

8. Unilateral slightly destructive tuberculosis should be treated conservatively under careful observation. Nephrectomy is indicated only when progressive disease is present.

9. Extensive unilateral destructive lesions should be treated by surgical methods.

10. Bilateral destructive renal tuberculosis is not a surgical condition except to stop hemorrhage or to relieve pain and sepsis, the result of an obstructed ureter.

11. This condition is not always a hopeless one as ordinarily considered. Under careful medical management it may be compatible with life and useful work for a number of years.

12. Genital tuberculosis is usually an infection of the prostate and epididymis and in a high percentage of patients is associated with a renal lesion.

13. Tuberculous abscesses of the prostate occurs frequently. They drain into the posterior urethra and may produce pus and tubercle bacilli in the urine.

14. Tuberculosis of the epididymis is often an acute disease and may be cured by drainage and heliotherapy. When an operation is necessary it should be epididymectomy and not orchidectomy.

15. Surgical treatment of tuberculosis does not cure the disease but is merely a mechanical aid in producing a clinical result.

16. Constitutional treatment of urogenital tuberculosis is important and should supplement the surgical treatment, both before and after operation.

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CERVICAL RIBS AND ABNORMAL FIRST THORACIC RIBS*

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A SUPERNUMERARY cervical rib is formed by the overdevelopment of the anterior root of the transverse process of the seventh cervical vertebra (Bickham). Todd[7] states that cervical ribs are apparently normally present in the embryo but are present after birth as only transverse processes. Jones[4] especially contends that variations in formation of the brachial plexus are important factors while Todd holds that the blood vessels in the cervico-thoracic region are of equal importance in this condition. Although congenital, these deformities seldom cause trouble until adult life. Keen[5] says this is due to the fact that as we grow old the tone of our muscles is somewhat lost, which allows the shoulders to droop, and this increases the angulation of the plexus and vessels passing over the ribs. Some have stated that this anomaly is usually associated with some other, but this observation has not been generally confirmed. Henderson[3] states that *embryologically* each cervical vertebra has a costal process which unites with the transverse process to form the costo-transverse foramen. The cervical rib arises as a result of the overdevelopment of this costal process and in the dorsal region this forms the normal rib.

Brickner and Milch,[8] in 1925, reviewed the literature and reported two cases. They give Keen the credit for having recognized and described this unusual condition and having reported two cases in both of which cervical rib was diagnosed, but later proved absent. Neither case was operated upon. They illustrate the type where the first thoracic rib on one side is located at a somewhat higher level than its corresponding mate. Others (Lane, Helen, and Lebance) have reported rudimentary or joined first ribs. Murphy, Bramwell, and Brichner have reported symptoms from apparently normal first ribs. Various theories have been advanced for the peculiarities in the development of the first rib but none have been proven. Wood Jones seems to have shown that rudimentary ribs occur when the second dorsal nerve takes part in forming the brachial plexus.

J. B. Murphy,[6] in 1906, stressed the point that the plexus and artery always passed behind the anterior scalenus muscle and that symptoms might be caused by compression between the muscle and rib. Also that acute angulation of the vessel over the rib may be a factor in producing vascular symptoms.

Todd feels that developmental influences are vital factors, and states that the axis of growth in the arm is at the level of the seventh cervical, and that the eighth cervical and first dorsal nerves course upward and over the ribs downward. Excess tension, angulation or stretching of these nerves over a normal or abnormally high rib or tumor of the rib would produce symptoms simulating those of a cervical rib.

Adson does not agree fully with Todd when the latter attributes the vascular symptoms to trophic disturbance caused by paralysis of the sympathetic fibers passing to the vessel and the skin. Adson is of the opinion that insufficient emphasis has been placed on the influence of the scalenus muscle which produces the compression of the artery and nerves against the cervical rib, or to abnormalities of the first rib. He has observed at operation that the muscle has a wide tendinous insertion which narrowed the space for the vessel and nerves.

Anatomy.—Supernumerary ribs are bilateral in 75 per cent of cases and are more frequently encountered in women. Many do not cause any symptoms and are often found accidentally in routine chest X-rays. It has been estimated that only 10 per cent require surgical interference. According to Adson, the credit for the first description of a cervical rib in detail belongs to Galen and Vesalius.

The size of the rib varies from just a rudimentary bud to that of a complete rib which resembles the first thoracic and unites with it anteriorly by means of a true cartilaginous attachment. The complete rib curves out laterally and then passes forward and downward between the anterior and middle scaleni muscles and attaches to the cartilage of the thoracic rib. The brachial plexus and the subclavian artery pass over it. The anterior scalenus muscle passes down in front of the artery and may attach by some fibers to the cervical rib but its main normal attachment is to the first thoracic rib. The phrenic nerve lies on the anterior surface of the anterior scalenus muscle. In addition to these important anatomical landmarks, the carotid sheath and others of less importance are crowded into a comparatively small space. The pleura is attached to the under surface of the extra rib and therefore the thoracic cavity is higher on that side.

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*From the Division of Surgery, the St. Paul Clinic. Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 24, 1932.

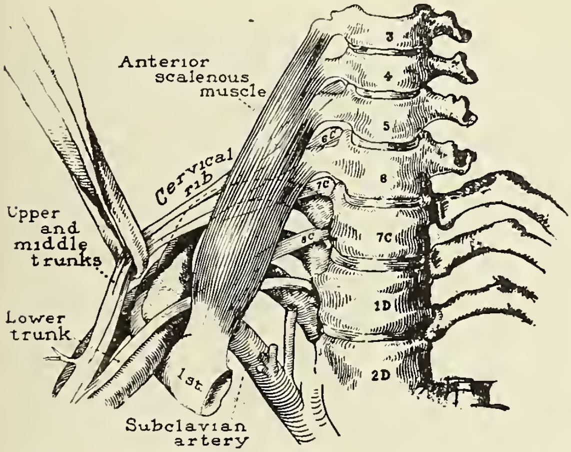

Fig. 1. Anatomical relationships. (Taken from Adson's article.)

In 1861, Coate performed the first operation with success and the operation had been repeated seven times by 1895. Keen collected forty-two operative cases with removal of the rib up to 1906.

Symptoms.—Patients are frequently seen who have run the gauntlet of therapeutic measures for so-called rheumatism, myositis, and neuritis of the arm, and have received no relief. A careful inquiry into the history reveals that other symptoms are also present, but are not so prominent or noticeable as the pain. Occasionally weakness, disturbance in sensation, changes in pulse and blood pressure, discoloration and even atrophy may be present, and I am sure that in many cases in the past, X-rays should have been taken.

Adson states that the important and characteristic symptoms of cervical rib are one or more of the following: pain, hyperesthesia, atrophy, motor weakness, disturbance in sensation and circulatory abnormalities.

Pain may be noticed along the course of any of the branches of the brachial plexus, but in our cases, branches from the lower trunks of the plexus have been most frequently involved. The pain varies in quality and intensity according to the degree of pressure that is exerted by the extraneous rib. Pain is most frequently noticed during the latter part of the day, or after continuous or heavy work involving use of the arms in such a way that they are stretched or pulled downward, as in lifting. Twisting motion may bring it on forcibly as exemplified in one of my patients.

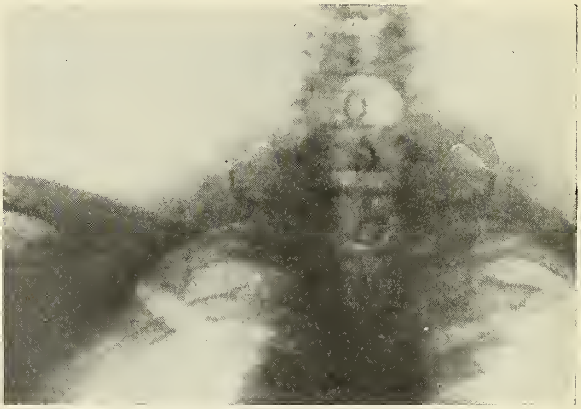

Fig. 2. Bilateral cervical rib. Rudimentary type.

Disturbances in sensation from hyperesthesia to anesthesia may occur. In fact, one case presented hyperthesia comparable to "trigger zones" in trifacial neuralgia, touching certain areas on his middle or ring finger causing exquisite pain to shoot up the arm. Burning, tingling, and numbness are often associated and patients will tell you how they have to "rub their hands and fingers to get the life back into them."

An interesting test is to have the patient raise the arm, stretching it straight above the head. This should give relief from pain as it temporarily reduces the angulation of and pressure on the nerves and vessels over the extra rib or over an elevation or tumor of the first rib.

Hyperextension of the head or neck to the opposite side may increase pain and may also obliterate the pulse on the affected side. Atrophy is rare and quite variable in degree. Its extent depends primarily on how large the extra rib is and just how far down on the first dorsal rib the cervical rib attaches. Usually the larger ones come in contact with more roots of the plexuses and put them on greater stretch, causing correspondingly greater involvement. For many years it has been noted that the scalenus anticus muscle by its direction and attachment provides a smaller groove for the artery and plexus in the presence of a cervical rib. Some have gone so far as to state that gangrene may result from pressure of the muscle on the artery. Others have claimed that the ischemia and gangrene of the finger tips is due to pressure on the sympathetic fibers which supply the vessels themselves, causing spasm and constriction, and limitation of the blood supply.

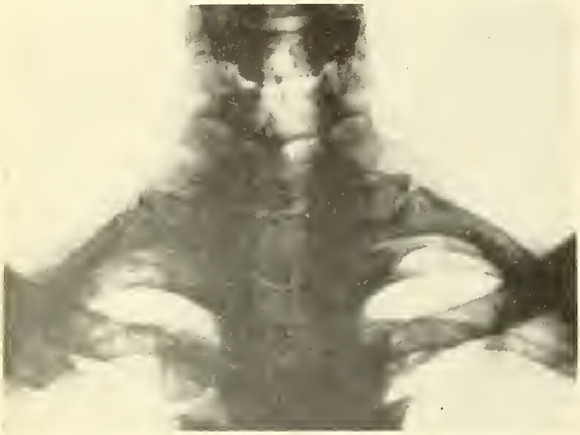

Fig. 3. Bilateral cervical rib attaching to the middle of the first thoracic rib.

A recent article by Funston calls attention to deformities of the hand and wrist—as club hand—in infants as a result of cervical ribs.

In general, cases should be divided into three groups, depending on the symptoms:

1. Neurotic patients with indefinite pain in the distribution of the brachial plexus without circulatory disturbance. Surgical interference should be cautiously advised in this group. Very frequently in these patients pain is attributed to anomalous conditions and is not relieved by surgical treatment.

2. Those in whom symptoms are produced by anomalies in the supraclavicular triangle similar to those produced by the cervical rib and the scalenus anticus muscle, such as a high placed or tumor of the first thoracic rib. With this group of symptoms, exploration should be carried out.

3. Cases with definite symptoms directly attributable to cervical rib:

a. Brachial pain with sensory or circulatory disturbance sufficient to incapacitate the patient.

b. Atrophy of the hand and arm on the affected side.

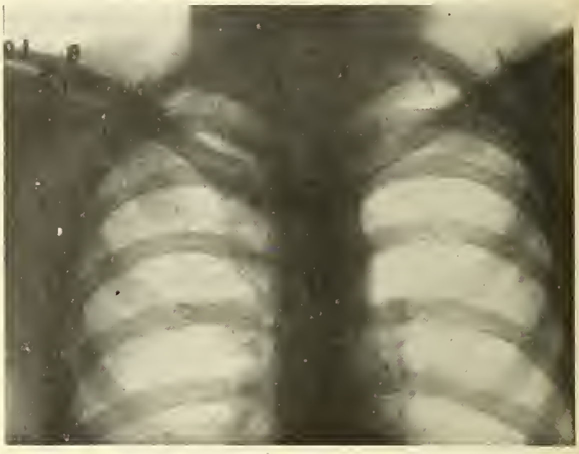

Fig. 4. Bilateral cervical rib with marked projection downward on left side.

c. Circulatory disturbance on the affected side sufficient to be demonstrated by an alteration or obliteration of the pulse on extending the neck or rotating the head but not producing pain or atrophy.

In the third group, surgery is advisable. The circulatory disturbance may be slight and produce nothing more than a dusky appearance of the skin, or it may be sufficiently severe to produce thrombosis of the radial or ulnar artery, or both, with gangrene of the finger tips. Since the scalenus anticus muscle in the presence of a cervical rib is capable of compressing and traumatizing the subclavian artery to the extent of producing thrombosis, surgical treatment should be urged when the circulation is disturbed on the affected side even if nervous symptoms are mild or absent.

There is a case reported in which spasm of the diaphragm was relieved by removal of the cervical rib. The phrenic nerve lay on the anterior surface of the scalenus anticus muscle and was impinged by the rib. According to Adson and Coffey, circulatory symptoms were present in seventeen of 303 cases.

Atrophy may in part be due to disuse, as these patients generally restrict the use of the painful arm. There may be sweating on one side of the arm and dryness on the other, a difference in pulses, blood pressure, and color of the skin (pallor or at times cyanosis). A mass may be felt in the supraclavicular triangle in thin people. Tenderness on pressure was present in our cases although it is not usually described.

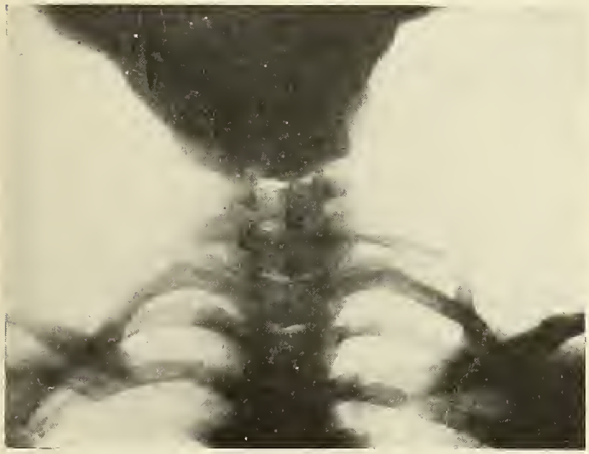

Fig. 5. Bilateral cervical ribs with fracture of the one on the left side.

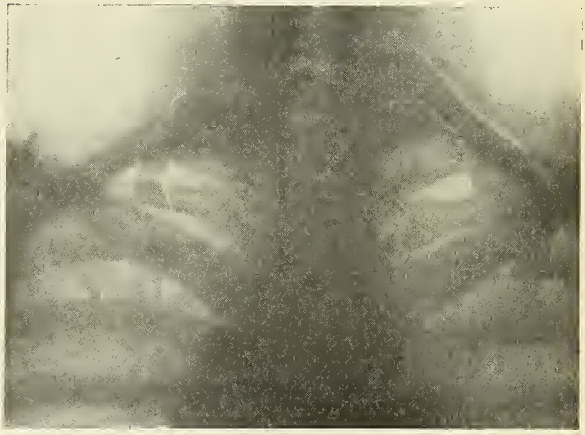

Fig. 6. Margin of first thoracic rib, simulating symptoms of cervical **rib.**

While cervical ribs are not uncommon, anomalies of the first thoracic ribs causing symptoms are not of such rarity that attention should not also be called to them. As previously stated, they may produce a train of symptoms very similar to cervical ribs, and should be considered in making a differential diagnosis of the course of nerve and vascular symptoms in the upper extremities. It is an interesting fact that symptoms do not become apparent until the patients have at least reached middle age. At this time, there may occur a change in the position of the shoulders and they slant more downwards, making a different angulation for the plexus and vessels as they ride over the ribs.

Differential Diagnosis.—Even though an enlargement of the first thoracic or cervical rib may be present before operative interference is advised, we must rule oue such conditions as myelitis, anterior poliomyelitis, progressive muscular atrophy (Aran Duchenne type), syringomyelia, and peripheral neuritis. A careful history and neurological examination will definitely rule out these conditions.

Treatment.—Operative treatment is the only means of securing permanent relief.

Three methods of approach have been described:

1. Lateral route of Thorburn;
2. Posterior route;

These methods have for their object, the removal of at least a portion of the extra rib. Adson, however, has definitely shown that this is unnecessary, and he advises

3. The anterior approach.

This is the technic I use. A transverse incision is made in the supraclavicular space, the anterior scalenus muscle identified, and the brachial plexus exposed. It may be impossible at this point to identify the artery from the plexus, if pulsation is not present. By careful dissection, the plexus can be separated from the artery, and the compression of the artery by the anterior scalenus muscle in front and the rib behind can be easily seen. The phrenic nerve can be identified lying on the anterior surface of the anterior scalenus muscle. It is retracted medially and the plexus gently retracted outward. The anterior scalenus muscle can then be cut transversely at a level just above the artery. The muscle will immediately retract and the artery can be seen to pulsate again. The wound is closed without drainage. Both immediate and late results are much better following this simpler operation.

Two cases, illustrating changes in the first thoracic rib, producing symptoms simulating cervical rib, are of sufficient interest to warrant a more detailed report.

CASE REPORTS

Case 1.—F. M., a widower, aged thirty-five, gave a negative family history. He had never had any serious illness, operations or accidents. Two months previous to examination, while turning down some grease cups on some farm machinery, he thought he strained the muscles of his left arm and hand, but did not pay much attention to it at the time. A couple of days later, his hand began to tingle and itch as though he had chilblains. A little later, his left hand began to get cold more easily than his right, and he had to wear two mittens on it. The ends of his fingers felt dead at times. This was about three weeks after the supposed injury. Then he noticed a loss of strength in the left arm and the grip was poorer. These symptoms gradually became worse and he noticed definite muscle weakness in the left hand.

Two weeks previous to examination, he was driving his car when he noticed that his left hand suddenly turned white and became ashen and there was severe pain in the middle finger. He was obliged to stop driving. This condition lasted one hour, and by massage he was able to bring back the color and feeling in his hand. Later, pain in the hand and especially the middle finger increased. Unable to sleep at night, he had to get up and walk the floor, rubbing his hand and fingers. Heat aggravated the pain. Pulling on the fingers seemed to relieve the pain. Certain areas became extremely hypersensitive. A week previous to examination, the home doctor made an incision into the tip of the middle finger, which was discolored and tender, in an attempt to relieve the pain. This did not help and the tip of the finger became black and hard.

Examination proved negative except for the left arm and neck region. There was a marked difference in the comparative muscle strength of both arms. His left hand was cold, weak and quite useless. His hand became pale when he tried to grasp an object. There was some atrophy of the interossi and muscles of the forearm. The finger tips were hypersensitive and a small area of gangrene was present at the tip of the middle finger, where it had been incised. The radial and ulnar pulse were gone. Blanching of the skin and back of the hand on pressure remained for some time after the pressure was removed. Only a faint suggestion of a pulse could be felt in the region of the brachial artery. The left supraclavicular space was somewhat fuller than the right but no definite mass could be palpated. A bruit could be heard above the left clavicle, a humming sound as over an aneurysm.

The blood Wassermann was negative; hemoglobin 88 per cent; B. P. 144/80, both right and left. The stereoscopic X-ray of the chest was negative *except for* an enlargement of the middle anterior portion of the first rib on the left side which appeared to be an osteoma.

Diagnosis.—Operation was undertaken to relieve pressure on the left subclavian artery and brachial plexus especially the eighth cervical and first dorsal nerves. The technic followed was according to Adson's method of cutting the anterior scalenus muscle. The patient made a very excellent recovery in every respect.

Case 2.—A male, aged thirty-three, gave a family and past history which were essentially negative.

About two years previous, he had noticed at times a numbness and tingling in the second finger of his right hand. He did not pay much attention to this at first, but a little later on it became more pronounced, and he would have pain extending to the elbow. He noticed that this pain became worse when he did some heavy lifting. At times it would extend up to the shoulder region. The skin on the palmar surface of the second finger became very thick and had a tendency to crack. At times the first two fingers became very numb and he had to rub them to obtain relief. He noticed that at night he had to lie on his left side and place his right arm on the pillow, rotated outward in order to sleep. He had tried various salves and massage, but nothing seemed to give him relief.

The general examination was negative except for the first two fingers of his right hand, which showed a trophic disturbance with a thickening, peeling and cracking of the skin. The tips of these fingers were very hypersensitive. He stated that at times small blisters had appeared.

The urine, blood Wassermann, and blood pressure were negative.

X-rays of his chest and arm were negative except in the right supraclavicular area. The first rib on the right flared out much more than that on the left. This caused the plexus and vessels to be stretched and pulled at a different angle over the first rib. This would tend to increase the pressure by the anterior scalenus muscle and we felt that operation should be done in this case.

In the meantime, the patient is not using that hand for any lifting, and is feeling more comfortable. However, the trophic disturbances are still present.

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MYOSARCOMA OF THE RECTUM*

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Myosarcoma of the rectum is no doubt a rare lesion and from this standpoint it does not seem important, yet because of the type of treatment advisable for these lesions, it appears justifiable to present the following cases.

Many types of sarcoma of the rectum have been described from time to time, depending on the predominant type of cell found in the neoplasm. Among them are lymphosarcoma, melanosarcoma, fibrosarcoma and spindle cell sarcoma, and in each of these groups a fairly large number of cases has been reported so that sarcoma of the rectum as a general group is not an unusually rare lesion. However, if myosarcoma is considered in a group by itself, only four undoubted cases could be found in the literature. Exner, in 1908, described two cases; one of the patients was a man aged forty-nine years and another a woman aged fifty-one years. Lapeyre in 1920, reported a series of thirty cases of primary sarcoma of the rectum, two of which were myosarcoma. Of the four cases reported in this paper, two were reported by Thompson in abstract form in 1927.

REPORT OF CASES

Case 1.—A farmer, aged sixty-two years, first came to the clinic in 1911, at which time a hard fixed mass about 5 cm. in diameter was found in the left side of the rectum near the anus. Symptoms except mild constipation were not referable to this mass. He refused treatment and was not seen again until December, 1916. During this interval constipation had increased, and he was beginning to notice a constant sense of fullness in the rectum. He had been having increasing difficulty in voiding urine, and three weeks before admission an attack of acute retention had required catheterization of the bladder.

On examination a large, rounded mass about 12 cm. in diameter was located in the area described, extending from the sphincter of the anus to the vesical neck. In January, 1917, through the perineal route, a soft friable tumor weighing 330 gm. was enucleated without great technical difficulty. Convalescence was uneventful and the patient had no further trouble until a year later when his previous symptoms returned. A large recurrent mass was found at the site of the former operation. This was excised and the wound was left open for radium treatment. For the next eleven months 2,700 milligram hours of radium were given in five treatments, but the tumor continued to recur and at the last examination, in January, 1919, the patient was having considerable difficulty in getting his bowels to move. He has not been heard from since. Pathologists reported the tumor to be a fibromyosarcoma (Fig. 1).

Case 2.—A man, aged fifty-nine years, came to the clinic November 3, 1919, complaining of having had difficulty in moving his bowels for six or seven months. There had also been some frequency of urination for the last month or two.

General examination was negative except for a large rounded mass 5 cm. in diameter on the posterior wall of the rectum about 2 cm. above the internal anal sphincter. The mucosa was not ulcerated and cystoscopic examination did not reveal abnormalities. November 18, 1919, the tumor was removed through a posterior incision. Microscopic examination of the lesion disclosed myosarcoma.

The patient had no further symptoms until November, 1923, when he returned to the clinic because of protrusion of a small piece of tissue from the anus. A recurrent mass fixed posteriorly and breaking into the rectal mucosa was found. Wide excision of the mass was done and after an uneventful convalescence the patient was free of symptoms until December, 1924, when further recurrence was noted. The mass was again excised and radiotherapy was carried out over a period of four weeks. The patient died about a year later, after wide extension of the growth (Figs. 2 and 3).

Case 3.—A man, aged sixty-four years, entered the clinic March 30, 1921, with complaints of frequent and difficult urination for three months, and of one attack of acute retention requiring catheterization. Constipation was increasing and bowel movements had been noticeably smaller in caliber for the last five years. He also had occasional sharp shooting pains in the rectum.

A large, smooth partly fixed tumor filling the pelvis was found. Through the proctoscope this did not appear to involve the rectal mucosa, although it was attached to it. The tumor, weighing 354 gm., was removed April 11, 1921, through an anterior incision and radium was placed in the area. Further radiotherapy was given during convalescence. After temporary improvement the tumor apparently recurred at site of removal, and the patient died March 4, 1922. The pathologic diagnosis was myosarcoma (Fig. 4).

Case 4.—A man, aged fifty-one years, had been examined at the clinic in 1921 with essentially negative results. He returned in April, 1931, complaining of a slow growing lump just within the anus which had first been noticed shortly after his visit in 1921. In 1929 the lesion had reached a diameter of 5 or 6 cm.

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*From the Division of Surgery, The Mayo Clinic.

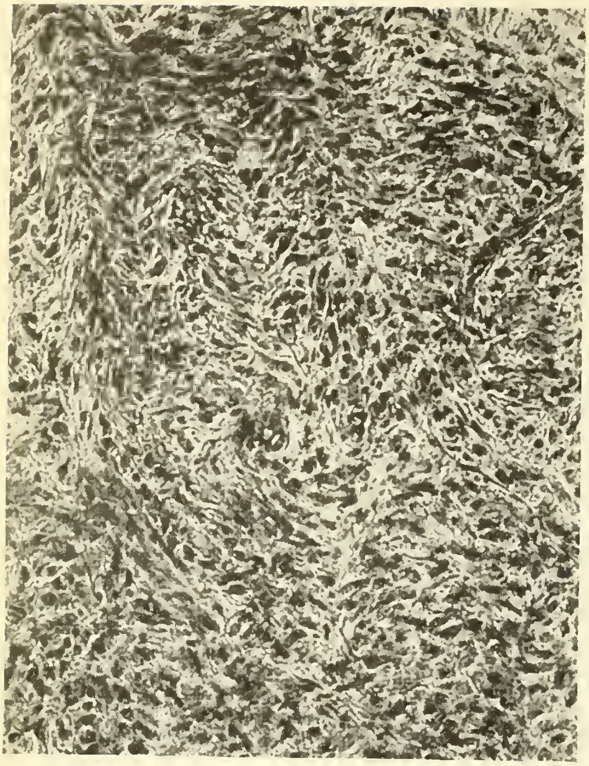

Fig. 1 (Case 1). Myosarcoma of rectum. Original tumor removed January, 1917; moderately cellular although myomatous and fibrous elements predominate. Sarcoma of grade 1 according to Broders' classification.

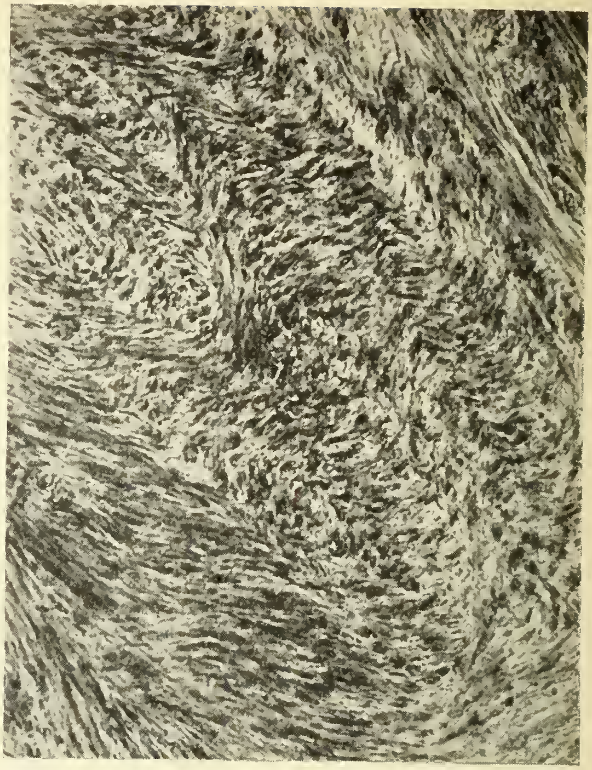

Fig. 2 (Case 2). Primary lesion removed November, 1919. Rather cellular fibromatous and myomatous structure.

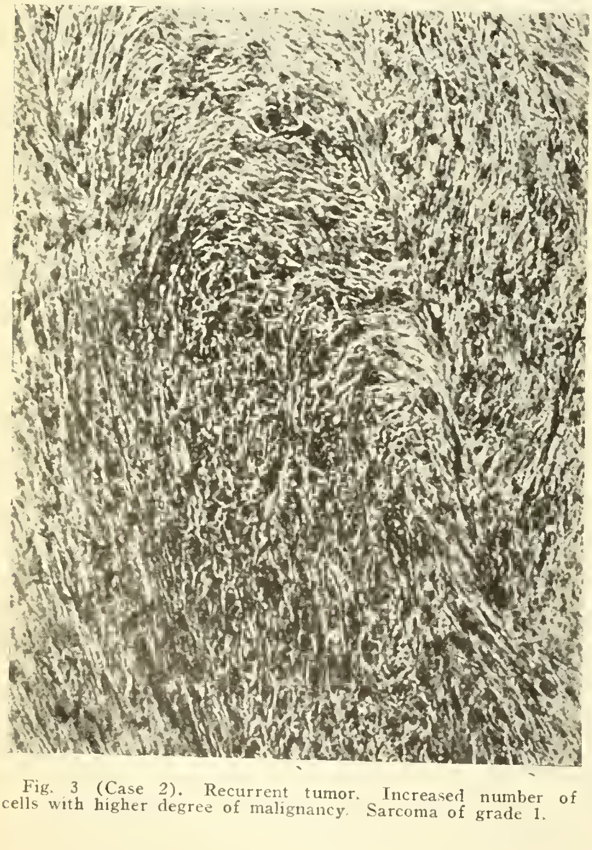

Fig. 3 (Case 2). Recurrent tumor. Increased number of cells with higher degree of malignancy. Sarcoma of grade 1.

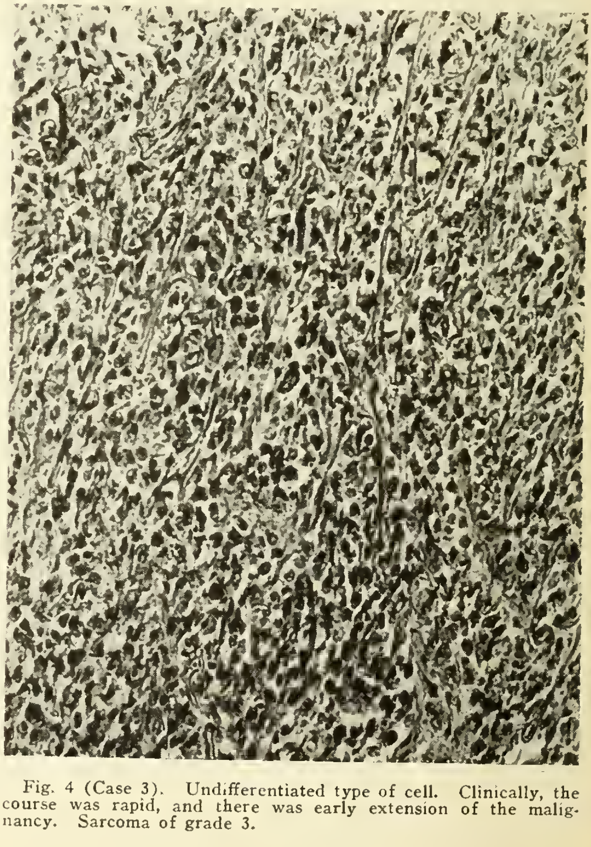

Fig. 4 (Case 3). Undifferentiated type of cell. Clinically, the course was rapid, and there was early extension of the malignancy. Sarcoma of grade 3.

and was excised locally by the patient's home surgeon. This mass had recurred and in April, 1931, was again excised. The pathologic diagnosis was myosarcoma. On his return to the clinic in January, 1932, another recurrence had taken place. This had not caused symptoms except occasional pain locally, especially after he had been sitting for a long time.

Examination disclosed one mass anteriorly just above the dentate margin of the anus, and a larger one to the left of this area about 3 cm. in diameter. On account of the marked tendency of the tumor to recur a radical operation was decided on. February 26, 1932, 45 cm. of the rectum and sigmoid were removed by a combined abdominoperineal type of resection. Metastasis was not found within the abdomen or about the growth. Convalescence was normal and the patient was dismissed the twenty-ninth day after operation in excellent condition (Fig. 5).

The unusual and important points demonstrated by these four cases are that the symptoms caused by the lesions were unusual in comparison with the common lesions of the bowel; their tendency to lie under the mucous membrane and ulcerate late makes it rather difficult to arrive at an accurate diagnosis without a microscopic section. The second important observation is the rapid and uniform recurrence with failure to respond to irradiation. The bad prognosis indicated by this small series of cases in which local excision and irradiation was done unsuccessfully would seem to indicate the desirability of radical operations on the recognition of the type of lesion with which one is dealing, that is, if the diagnosis is obscure.

SUMMARY

The characteristics of myosarcoma of the rectum may be summed up as follows: 1. The lesion occurs most frequently among men in the fifth and sixth decades; only one case of a woman was found recorded in the literature. 2. The tumor is slow growing with late metastasis but with marked tendency to local recurrence. 3. The tumor occurs as a rounded circumscribed mass lying close to the internal anal sphincter and originating in the muscular tissues; later it breaks through into the rectal mucosa and then externally to the perianal tissues. 4. After involvement of the mucous membrane the lesion somewhat resembles carcinoma, but the two can usually be distinguished by careful examination. A myosarcomatous tumor possesses a broad indurated base resulting from considerable growth before the mucosa is reached. The lesion encroaches on the lumen to a greater extent than does carcinoma, resulting in symptoms of obstruction before ulceration and bleeding occur. 5. Regional lymphatic involvement is apparently rare in cases of myosarcoma, but common in the case of carcinoma; death in the former takes place from direct extension to pelvic organs, to obstruction and to local recurrences, and when the blood stream is invaded to generalized sarcomatosis. 6. In the clinical differentiation the chief conditions to be considered are carcinoma, syphilis, tuberculosis, and polyps. The early involvement of the mucous membrane in carcinoma, resulting in ulceration, bleeding, infection and frequently cachexia, is contrasted to that of myosarcoma in which constipation, straining and urinary difficulties are the first symptoms. 7. Myosarcoma exhibits a marked tendency to local recurrence after excision. This is evidenced in each of the four reported cases, and it would seem that radical treatment by wide excision locally is warranted. Furthermore, it seems very unlikely that much benefit can be derived from radiotherapy even in large doses so that resection is, no doubt, the treatment of choice.

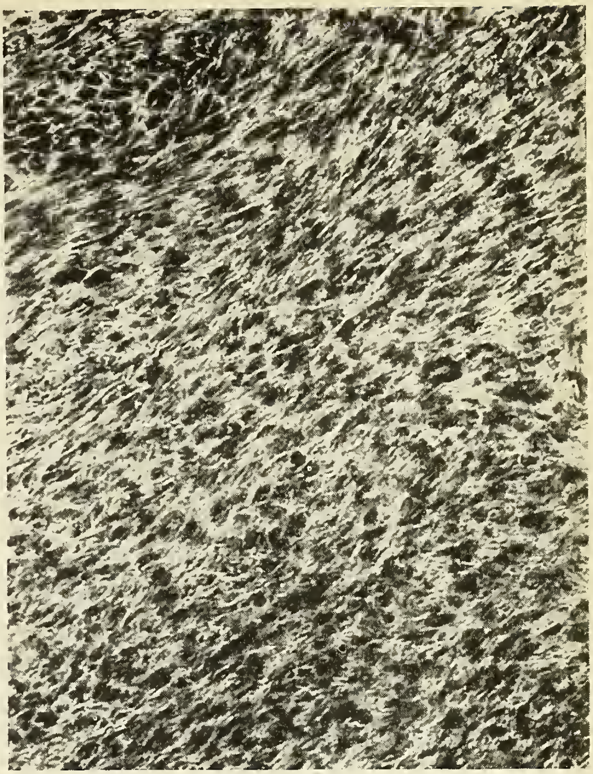

Fig. 5 (Case 4). Section from tumor removed February, 1932. Slow growth but marked tendency to recurrence. Sarcoma.

ACUTE INTESTINAL OBSTRUCTION*

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In any study of intestinal obstruction the mortality rate is still found to be very high. In fact, it is much higher than in any other condition within the abdomen which demands surgical treatment. In the statistical studies which I have examined I have found that where one hundred or more cases have been taken into consideration the mortality rate ranges between 15 and 65 per cent.

The present study is based upon 128 surgical cases treated at the hospitals of Duluth during the past ten years. It includes only cases of complete obstruction in which the diagnosis was established at operation or at autopsy. It does not include cases of postoperative ileus, but only those of a mechanical nature. In this series of 128 cases there were forty-three deaths, a mortality percentage of 33.66. This is very much lower than in many of the studies above mentioned, but it shows a high rate of mortality when compared to other acute abdominal conditions.

Surgery cannot be blamed for this high mortality rate, for a mechanical obstruction can be cured only by surgical treatment. Some studies have reported a mortality rate of 70 per cent when medical treatment was used. The consensus of opinion among medical men is to the effect that a spontaneous rectification of a mechanical obstruction is very rare indeed and may well be called a curiosity. It is assuredly not due to sound scientific treatment. The reason for a high mortality rate in surgically treated cases is due to the delay arising between the event of the obstruction and the time of the operation.

The pathology is not always the same and in some cases death may come precipitately, evidently due only to shock. While a young student my attention was first called to this phenomenon in a very dramatic way. A man of approximately seventy years of age was seen at the dispensary and during the general examination the truss that he was wearing was removed. Immediately he complained of a severe pain which was caused by an acute obstruction in an inguinal hernia, and he died before he could be prepared for an operation.

Shock is always a conspicuous feature in some types of intestinal obstruction; it is present to some degree in all cases of strangulation obstruction and depends entirely upon the amount and the degree of occlusion of the blood supply to the affected bowel. In the late stage, shock is due to toxins in the circulating blood, to marked distention of the intestinal coils above the site of the obstruction, to dehydration, and to anoxemia.

Neither patients nor animals used experimentally will die within a definite and fixed time after the event of an intestinal obstruction, because the pathological process that is present is always the determining factor. The higher the obstruction, the more precipitous is the approach of death. A simple obstruction does not bring fatal results as rapidly as does a strangulation obstruction. A short loop obstruction terminates fatally more rapidly than does a long loop. This has been conclusively proven by Maury. Other factors such as the age of the patient, whether or not infection is present and the general physical condition of the patient are all very important. The time that has elapsed between the onset of the symptoms and the surgical treatment is the key to the prognosis of every case. Each hour of procrastination adds materially to the rate of mortality. In all studies the statistics given show a mortality of 50 per cent or more in cases where there has been a delay of fifty hours.

The surgeon is frequently not responsible for delay in the treatment of obstruction. Many of the patients in this series of cases were sick for many hours, and even days, before medical advice was sought. In the meantime the patient had taken cathartics and had been subjected to all sorts of concoctions and home cures. The internist, the general practitioner, and even the surgeon have often wasted hours and even days in trying to arrive at the proper diagnosis—resorting to exhaustive laboratory tests, the giving of enemata and even dosing the patient with cathartics. The assertion of C. H. Mayo that he has never observed a patient die because of an exploratory incision, but that he has often seen death occur because it was too late, should certainly always be in the foreground when one considers the diagnosis of an intestinal obstruction. An exploration should be undertaken whenever this condition cannot be excluded.

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*From the Department of Surgery, the Duluth Clinic, Duluth. Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

It is difficult to understand why we find in a study of a series of cases of intestinal obstruction, that there are almost always very definite evidences of many hours of delay, while in all other acute abdominal conditions early operations are the rule. An intestinal obstruction should always be considered as an emergency, because immediate surgery holds the only hope of a cure and the elimination of unnecessary mortality.

That there is an increasing mortality due to delay is shown in Table I.

TABLE I

Hours	Cases	Deaths	Mortality Percentage
1– 8	26	2	7.7
8–18	35	7	20.0
18–36	11	3	27.2
36–48	20	6	30.0
Over 48	36	25	69.0

This reported mortality is similar to that given in other studies. H. W. Tuttle reported a rising mortality beginning with no deaths in thirteen cases that were treated within the first six hours. Thereafter the deaths increased rapidly up to 41 per cent. C. Jeff Miller found a mortality rate of 29.4 per cent in those cases treated during the first twelve hours and an increase to 84 per cent when the delay reached an upper limit of 96 hours. He states that he believes that in all cases where the delay exceeds 48 hours the rate of mortality will be over 50 cent.

In my personal series, which consists of thirty cases with seven deaths, a mortality rate of 23.33 per cent, all were treated after a delay of over eighteen hours. This is an experience entirely too limited upon which to base any conclusion. However, it shows the definite tendency toward a lower incidence of mortality when treatment is promptly effected.

Our older textbooks usually stated that the cause of obstruction was usually due to some type of hernia. We now find that some previous surgical operation of the abdomen accounts for the greatest incidence.

The causes of obstructions in this series are as follows:

Adhesions	49
Bands	14
Postoperative Hernia	4
Meckel's Diverticulum	7
Carcinoma	8
Mesenteric Thrombosis	1
Volvulus	3
Congenital Hernia	28
Intussusception	14

In a majority of the cases in which the obstruction was due to either adhesions or to bands there was a history of a previous abdominal operation.

Many theories are given to explain the cause of death in acute intestinal obstruction, but so far the exact cause is not definitely known. On this subject the best review is given by Cooper. He states that certain factors are known, but that very much is yet unknown. There is need for extended investigation because much confusion has resulted from the experimental work that has been done up to this time.

The early work of Hartwell and Hoguet, in which they made the discovery that dogs with obstruction will live longer when given intravenous saline than when not so treated, was the first to throw light on the subject. That loss of chlorides was one of the most important causes of death in high obstruction was first pointed out by Hayden and Orr. Their ideas on its exact effect have changed, but they and many others have absolutely proven that loss of chlorides is a very important factor in all cases of high intestinal obstruction. Whether or not toxemia exists in simple high obstruction is not certain, but if present it certainly is of minor importance.

In intestinal obstruction with strangulation there are many other factors, such as the presence of the high intestinal secretions, the formation of toxins, the amount of toxins, the presence of dead tissue, the absorption of substances through the bloodless dead bowel, the length of loop of bowel involved and many others. Time will not permit a discussion of them all.

That the presence of high intestinal secretions is a factor has been discussed by many authors: Maury, Benedict, Brockman, White, and others.

The presence of toxins has been definitely proved, but the cause of their formation is still a mooted question. Wangensteen states that normal intestinal contents are as toxic as those of obstructed loops and that toxicity is probably due to autolysis of tissue in vivo.

That absorption from the strangulated bloodless bowel occurs is very definitely proven, but certainly it cannot be very rapid, for both man and experimental animals often die more rapidly after the release of the obstruction. This is due to the rapid absorption of toxins liberated into the normal bowel below the point of obstruction.

That a short loop obstruction is more rapidly fatal than a long loop obstruction is a common clinical observation, but *why* we do not know. Brooks, Maury, and others have proven conclusively that in animals the above observation is an absolute fact.

Many other factors must be considered in analyzing the cause of death, such as shock, infection, especially by the bacillus Welchii. In high obstruction the cause of death is not the same as in low obstruction, but in all cases the cause of death probably in some way is related to the secretion of the pancreas and bile.

The diagnosis of intestinal obstruction should not be based on the descriptions which are given in old textbooks on surgery, for if we wait for those to appear our patient is usually beyond hope. A careful history, with short observation plus painstaking examination of the abdomen which must include auscultation, percussion, palpation and X-ray examination, will give us all the evidence we need in arriving at a proper diagnosis.

I put history first, for here as in any other disease it is the most important means of diagnosis. The history of sudden, crampy, intermittent abdominal pain is always significant and very characteristic, especially if not relieved by vomiting or opiates. In the elucidation of the history very many factors should be painstakingly considered. The most important are: the question of a previous operation, whether or not infection was present at the time of the operation, the nature of the operation, whether the patient has ever had any infection in the pelvis or in any part of the abdomen, whether or not there has ever been any evidence of hernia, the character of the pain, the nature and amount of vomiting, and the question of stools.

Many patients will give histories suggestive of peritonitis, either recently or many years before. In this series there were a large number of patients that gave a history of either previous pelvic infection or appendicitis.

Auscultation of the abdomen is not used as often as it should be. The stethoscope alone is one of the most important instruments in the diagnosis of acute intestinal obstruction. Everyone should familiarize himself with the normal peristaltic sounds, for the stethoscopic findings in ileus, in mechanical intestinal obstruction and in peritonitis are all very characteristic in each case. Visible peristalsis, which is always present in chronic obstruction, is rarely seen in cases of acute obstruction. Loud sounds like water going over a waterfall are heard when mechanical obstruction is present. These sounds vary a great deal, depending largely on the proximity of the obstruction to the point where the stethoscope is placed on the abdomen. Very often the site of obstruction can be located by this means. These sounds are often very high-pitched when one nears the point of obstruction. Percussion reveals some tympany, but usually it is not marked. In palpation of the abdomen we usually find no point of tenderness, and this alone helps to exclude most other acute abdominal emergencies.

The X-ray evidence is very valuable in the diagnosis of bowel obstruction. Wangensteen has definitely pointed out that in X-rays, taken either in the erect or lateral position, "fluid mirrors" can be made out in which air is layered over the fluid.

When gas is present in the small bowel, it is definite evidence of obstruction but, to be sure, not always mechanical in nature.

Vomiting usually is present in high obstruction, but in low obstruction it may be entirely absent or only moderate in amount. Fecal vomiting is an absolute symptom, but should never be considered as an early sign. Therefore obstruction cannot be excluded if vomiting is not present.

Patients may pass gas or even have bowel evacuations in spite of the presence of complete obstruction.

Laboratory tests are absolutely of no value in the diagnosis of acute bowel obstruction. The findings that appear in blood and urine are all late signs. The patient's temperature, blood pressure and respiration may be entirely normal.

The patient may look and feel well except when he has intermittent cramps. We sometimes see very pronounced symptoms early. These, however, are due to strangulation obstruction and all the symptoms depend on the degree of strangulation of the flow of blood to the segment involved.

The treatment is always immediate surgical intervention. Never wait for absolute signs to determine the location or nature of the lesion, but always decide to do an exploratory procedure whenever obstruction cannot be excluded.

Preoperative care consists of giving fluids in the form of saline, either hypodermically or intravenously. That chlorides and water are essential to maintain the water balance and replace the chlorides lost either by vomiting or retention has been proven by a large number of workers. The mortality can be very markedly reduced, especially in all cases of high obstruction, by this one method alone. Complete stomach aspiration should always be done, and this can best be accomplished by passing a nasal or duodenal tube, which may be left in situ during the operation—to be used in the postoperative care. This precaution is very important for in this series of cases several patients died on the operating table due to drowning in their own secretions. A large amount of gas can also be evacuated in this manner.

Spinal anesthesia is an ideal anesthetic on account of the complete relaxation that it affords. However, certain rules which apply to all kinds of spinal anesthesia must be strictly observed. Especially should one remember never to use spinal anesthesia upon a patient in a moribund condition.

The incision should be placed in the midline, especially in cases where the site of obstruction is not known. At first the incision should be very small for it can easily be increased in length if found necessary.

The exact type of procedure to follow after the incision has been made depends on the condition found. In cases that are diagnosed early the obstruction is released. If the circulation returns to normal that will suffice. However, if some portions of the bowel appear to be slightly damaged, an enterostomy tube should be inserted. In cases where a large portion of the bowel is gangrenous, one must select the type of operation that is best suited to the individual patient. Some of them do best by first exteriorizing the bowel and leaving the anastomosis to a later date. Early cases of strangulation, where the blood supply does not return, are perhaps best treated by resection and anastomosis, usually followed by enterostomy. If the patient's condition is critical and no segment of bowel is deprived of its blood supply, an enterostomy alone is the operation of choice. Later when the patient's condition warrants, the obstruction can be released. In certain cases this will never be necessary for the cause of the obstruction cures itself. Those cases due to recent plastic peritonitis should, if possible, have all the adhesions freed and one or more enterostomy tubes inserted. Short circuiting operations are very valuable in some cases. Cecostomy should be done in cases where malignancy is the cause of obstruction in the large bowel.

Following operation saline administered by intravenous injection or hypodermically should always be given except in very early cases. The intake and the output should be very carefully charted. In one case the combined output through a nasal tube and an enterostomy tube was nearly eight quarts in twenty-four hours. The fluid required to keep the water balance nearly normal should be about 4,000 c.c. in excess of the amount lost through vomiting or drainage through the duodenal or nasal tube and that lost through the enterostomy tube. Glucose in 10 per cent solution intravenously is the best method of administering food to these patients. In some cases a transfusion of blood is indicated. If a large quantity of fluid is lost through the nasal tube or a high enterostomy tube, a large portion of this fluid should be given in the form of proctoclysis. In cases where the bowel is exteriorized, the contents coming from the upper segment should be inserted into the lower segment to prevent the loss of secretions of bile, pancreatic fluid, etc.

Bile, according to Brockman and Benedict, given by proctoclysis is a very valuable adjunct in the treatment of these cases.

SUMMARY

1. The mortality of intestinal obstruction is still much too high.

2. An early diagnosis and an early surgical intervention will decrease the mortality.

3. A history of cramps with no localized tenderness or pain in the abdomen when air is

visualized in the small bowel by X-ray and characteristic sounds are heard by auscultation are all the findings that are necessary for the diagnosis of intestinal obstruction.

4. Laboratory tests are of no avail in early diagnosis.

5. An exploration should always be done where an obstruction cannot be excluded. Mortality may be reduced only by early observation and an immediate operation.

6. The choice of surgical procedure depends on the condition of the patient and the damage found at operation.

7. Preoperative and postoperative care are important.

8. Spinal anesthesia is the anesthetic of choice.

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A CONSIDERATION OF THE UTILITY OF RADIUM IN THERAPEUTICS*

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IT IS not my intention to recount the achievements of radium in medicine in a city which itself is an important radium center. The splendid radium treatment given here is a result of the efforts of my former chief, Howard A. Kelly, and his associate, Curtis F. Burnam, who are outstanding pioneers in the science of radiology.

Treatment of disease by radium and roentgen rays is now an established addition to modern medicine. Therapeutic radiology has passed through the early stages common to all new forms of treatment: overenthusiasm, disillusionment and discouragement, and finally recognition of limitations and success in smaller but well-defined fields. In short, therapeutic radiology has passed from infancy to adolescence, and its possibilities and contraindications are more clearly demarcated. There is a definite scientific foundation for radium therapy; investigation of the physiology of normal and abnormal cells and their reaction to irradiation of short wavelength furnishes the basis for this.

Radium as a therapeutic agent is exceedingly costly. It is not likely to fall much below the present value of $70,000 a gram, although this represents a reduction to almost half its price when it was first used medically. The reason for its cost is threefold: the scarcity of the element in nature, the enormous quantiy of chemicals necessary in its extraction, and the length of time (measured in months) necessary to obtain the finished product from the crude ore.

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However, once purified radium is secured, the possessor has command of the most powerful and stable medicine known to science. It is an unequalled natural source of energy. The therapeutic rays are evolved from spontaneous disintegration of the radium atom and its decay products; hence this energy is given off at a constant rate which cannot be altered by chemical or physical means. The process of decay is slow compared to the lifetime of man. In twenty-five years only 1 per cent of radium will be lost through decay; half the radium now possessed will have disappeared in 1,690 years but the disintegration is so gradual that a substantial fraction of it will still be working and emitting rays at the same rate 100,000 years hence; to be exact, a sixty-fourth of the original purchase.

Radium becomes an ideal agent because of two characteristics: the energy liberated is constant and cannot be altered in any way, and methods of measuring the amount used are exact. The rays emitted are so powerful, and electrical instruments of mensuration so precise, that the radiations from less than one-millionth of a gram can be accurately measured.

Although radium is so scarce, less than 5 per cent of the rays emitted by the costly element are utilized. This seems very extravagant. However, the alpha and beta rays have been found too caustic for ordinary purposes of treatment, and of late years use has been made mainly of the gamma ray, which is so penetrating that a small percentage will pass through 15 cm. of lead. The physical factor of "penetration" must not be confused with the biologic effects of the rays. That gamma rays are tremendously penetrating does not imply that they are caustic or injurious in proper dosage; it is only the absorbed rays which act on the tissues, not the rays which pass on through. The gamma rays are on the average one hundred times as penetrating as beta rays, and the beta rays in turn are one hundred times as penetrating as alpha particles. The destructive or caustic effects are in reverse order: the alpha particles are more destructive than beta rays or gamma rays in the ratio of 10,000 to 100 to 1. The beta rays are screened out by metal filters, and the glass containers effectively stop the alpha rays.

To sum up, then, this agent is stable and evolves therapeutic rays at an unalterable rate. Consequently, if a physician reports all his factors in treatment, such as the amount of radium used, the size and shape of the applicator, the size and situation of the field treated, the duration of the treatment, the distance of the element from the part treated, and the metal filters employed, such treatment can be accurately duplicated at other places. Best of all there is no worry, as with other agents, as to whether the preparation is fresh and potent.

One more quality worthy of emphasis is that radium is extremely flexible, and can be used in a variety of ways. Roentgen rays are therapeutic rays of similar nature, although of longer wavelength; their mode of application is more fixed; roentgen tubes cannot be introduced into sinuses and cavities of the body. Radium can be used at a distance from the part treated, placed in cavities of the body, introduced as needles into the center of diseased tissue, or placed in sinuses and fistulas.

However, with an element producing such powerful rays constantly, over centuries of time, there is grave danger in introducing radium itself into the human body, through the alimentary tract or by hypodermic injection. The headlines in newspapers frequently record instances of "radium poisoning." The success of radium rays in treating a few types of malignant growth of certain organs became popularly appreciated; many commercial houses profit enormously by the sale of so-called radium waters, emanators, and activators for internal use. These products rarely contain any appreciable amount of radium; if they do, they seriously endanger life. Martland, in pathologic studies of painters of watch dials who ingested radium, demonstrated the fatal anemia engendered, and the radium osteitis and bone sarcomas which arise later to afflict patients who survive the first few years' ravages of the ingested radium. This is truly an important problem, when it is recollected that during 1926 more than 150,000 radium emanators were sold to the public on the Pacific coast alone, advertised to cure many ailments. These radium waters or emanators contain either the gas radon, known as radium emanation, which is the first decomposition product of radium, or else minute traces of a radium salt dissolved in water. In the first instance it is possible that no harm may result, for radon is very slightly soluble in water, and has a half-value period of only 3.85 days; most of it escapes as a gas before it is swallowed, and the remainder will shortly disintegrate. In the second instance, dissolved radium is introduced into the body, and readily destroys life, although possibly not until years have passed. A milligram of radium is about the size of a grain of sand; a microgram is one-thousandth of this and is invisible and chemically undetectable, but Martland has calculated that 10 micrograms of radium deposited in the body is sufficient to cause death. The soluble radium salts are converted into insoluble salts in the blood, and deposited throughout the skeleton. Martland calculated that the alpha particle, which comprises 92 per cent of the rays of radium, is the fatal agent. He has estimated that if 10 micrograms of radium were deposited in a skeleton in 1931, alpha particles would still be emitted from that skeleton in the year 3941, and that the number of such particles emitted each second in that year, would be 185,000. The beta and gamma rays emitted from this 10 micrograms are practically negligible in destructive effect; they together form only 8 per cent of the total rays. As stated before, alpha rays are never used in radium therapy, the glass container of the applicator effectively stopping them. In treatment, the rays employed are emitted by radium which is confined or inclosed in containers. The so-called poisoning results from release into the body of radium itself.

The same dangers apply to hypodermic injection of radioactive salts into the blood stream. This will inevitably produce death after a time, and is justifiable only in the occasional selected case of leukemia or Hodgkin's disease or other inevitably fatal malady, as a palliative procedure.

Treatment with radium, in the hands of physicians acquainted with the technic of administration, has achieved outstanding success in certain forms of malignant growth and in many benign disorders. The widespread use of radium in medicine in this country attests its effectiveness. At a recent national radiologic meeting, Dr. Sayers, of the United States Bureau of Mines, stated (if I cite him correctly) that there were about 84 gm. of radium in use medically in this country, concentrated in 250 hospitals, each of which possessed 75 mg. or more. There were only about seven states without radium for medical purposes.

Let me emphasize here that radium therapy is a highly specialized branch of medicine; the radiologist must have a profound clinical knowledge of disease as well as a thorough command of the technical aspects of irradiation. He must also coöperate fully with internist, surgeon, and pathologist to attain the best results. Years of experience are necessary, and radium treatment can be most efficiently carried out in hospitals where an adequate supply of radium is available and the personnel is experienced in its use. The "mail order" method of radium treatment is not very satisfactory; many business institutions rent the expensive element to any physician, with written directions for its use; this usage is not more commendable than prescribing drugs by mail. Treatment with radium cannot be standardized according to diagnosis, but each patient constitutes an individual therapeutic problem. A great deal of harm may ensue from the ill-advised application of so powerful an agent; a curable condition may easily be converted into a painful, intractable lesion.

Since much of the record of research and advance in irradiation is issued in journals on radiology that are not always of interest to the internist, it may be worth while to recount some of the trends and changing ideas about treatment. Radium and roentgen rays are indicated in certain types of malignant growth. The rationale of the treatment is that immature, rapidly-growing cells succumb more quickly than normal cells, and with smaller doses, to irradiation of short wavelength; in fact, this is carried much farther, in that the specific sensitiveness of the cells of different tumors is recognized and aids in prognosis. For instance, carcinoma of the uterine cervix is peculiarly susceptible to radium and roentgen rays; accessibility, and the resistance of the normal uterine tissue and vaginal mucosa are favoring factors. Bowing and I have reported five-year end-results in a large group of cases of carcinoma of the cervix; also, in carcinoma of the uterine fundus we found unexpectedly good results, although this is still more of a surgical problem in the operable case. In cases of carcinoma of the rectum we found good results in many cases, but not nearly such favorable results as those obtained with cervical lesions; the normal rectal mucosa is too susceptible, and we had to work in an infected field. Carcinoma of the tongue and pharynx are other conditions which are amenable to radium, also carcinoma of the skin and lip; however.

malignant growths of the esophagus, stomach, small intestine, lungs, liver, and other deep-lying organs, are rarely benefited by irradiation.

Through the centuries, the attitude toward treatment of carcinoma has gradually changed. The original idea was that of entire destruction, and the cautery was the usual agent employed. However, in recent times the idea of aiding resistance of the patient has gradually evolved, with building up of his natural defenses, in addition to treatment of the local lesion. This attitude has been assisted by the recent grading of carcinomas according to pathologic differentiation. The high grade, undifferentiated epitheliomas are faster growing, tend to metastasize to distant organs, and take life quickly, but are fortunately more sensitive to radium and roentgen rays. Irradiation tends to drive the malignant cell through a more differentiated stage, accelerating the life cycle of carcinoma cells and stroma and producing an arrested, senescent state. The low grade, more differentiated carcinoma cell varies in radiosensitivity, as a rule, and may extend slowly for years without widespread metastasis. If a low-grade type of growth is encountered, the patient has apparently a natural defensive reaction to the carcinoma. I recall one patient treated with radium at The Mayo Clinic, for a squamous cell epithelioma of the cervix. A six-year cure was obtained, but the patient returned with a totally different malignant condition; namely, a huge melano-epithelioma arising from pigmented moles on the dorsum of the thorax. The pelvic condition appeared healed, but this new malignant growth caused death in six months from its inception; apparently the patient's defense mechanism to carcinoma collapsed. Another case was that of a woman who had had a carcinoma of the breast removed surgically at The Mayo Clinic in 1910; in 1932 she returned with cutaneous metastasis, an event which would have occurred in most cases in a few weeks or months after the operation. Her natural defense against carcinoma must have been unusually high. Another patient was a man who was observed with an epithelioma of the lip in 1932, and with metastasis to the cervical nodes; the growth had recurred after an operation for epithelioma of the lip in 1913, another instance of strong defensive mechanism. These cases could be multiplied endlessly.

Radium as utilized in recent years is not employed to exert its caustic and destructive effect, but to arrest the spread of the carcinoma and to build up the patient's own defensive mechanism. This is accomplished, in our opinion, in part by the heavy filtration around the applicators, by which the more caustic rays are stopped. Another factor working toward the same end, is substitution of massive doses, given at one sitting, by fractional or divided doses; that is, smaller amounts are given over longer periods of time, although a large total dose is reached. Carcinoma appears to start locally in a few cells, which, due to some unknown stimulus, begin to grow rapidly and abnormally. If the internist can recognize the malignant growth in its early stage, before spread by extension and metastasis has occurred, and the growth is accessible, radium properly applied should arrest the condition. The radiologist works in close coöperation with the surgeon. Some lesions may respond best to surgical excision and prophylactic treatment with radium. Biopsy is always advantageous, except when the growth is covered by normal tissue. Treatment applied against carcinoma is perhaps analogous to the conquest of fire in the home. The old-fashioned way of fire-fighting, consisting of application of tons of water after obtaining access to the fire itself by liberal destruction with the fire-axe, was comparable to the former method of attacking carcinoma with the cautery. Fire-fighting has progressed; the attempt now is to discover fire at its incipiency, smother it with a chemical not destructive to neighboring structures, and prevent extension and widespread dissemination of the flames. This is roughly paralleled by modern methods of treatment of carcinoma with radium; the attempt is to smother or arrest the growth of malignant cells by highly filtered gamma rays, and still to preserve healthy and intact the defensive barriers of normal surrounding tissue.

For patients with carcinoma, who cannot be cured by irradiation, the value of palliation must not be minimized. Often, at the beginning, the hopelessness of attempting cure is recognized, and a limited course of treatment, suited to the patient's strength, must be planned; however, relief of pain and prolongation of life are accomplishments well worth while. In certain fatal diseases, such as chronic forms of leukemia and Hodgkin's disease, palliation is obtained from irradiation, that could not be gained from any other form of treatment.

Although treatment of carcioma may be spectacular, progress against benign and inflammatory lesions has been perhaps the main advance in treatment by irradiation. At The Mayo Clinic, of the patients who receive treatment by radium annually, more than 30 per cent are treated for benign conditions. Many of these lesions cannot be treated so successfully by any other method, and the results are most satisfactory. Radium is practically a specific in menorrhagia of the menopause, in many cases of uterine fibroid tumor, in treatment of some tuberculous lesions, and for many types of birth marks. It is also of inestimable value in many acute infectious conditions, as in the treatment of acute parotitis arising after a major surgical operation, and in the treatment of carbuncles, cellulitis, abscesses, and erysipelas. The rationale of treatment in many of these inflammatory conditions is not thoroughly understood, but appears to be a strengthening of the local defensive mechanism. The infiltrating lymphocytes in an acute inflammatory process are quickly broken down by irradiation, and one hypothesis suggests liberation of protective substances on disintegration of the lymphocytes. Fortunately these benign lesions can all be best treated by small doses, far below any destructive level, and well within limits of tolerance, for I can conceive of nothing more unfortunate than to treat a benign, curable condition and through lack of skill produce a serious, intractable lesion.

SUMMARY

The therapeutic radiologist is a physician primarily, and, besides his knowledge of the physical principles of treatment by rays, must possess a good clinical background, and have experience in selecting the type of case which radium will help.

The best results from treatment with radium are obtained in institutions possessing a sufficient supply of radium, with a staff of physicians skilled in its use; perfect coöperation between radiologist, internist, surgeon and pathologist is essential.

Radium is too powerful a substance to introduce into the human body by way of the alimentary tract or hypodermically; only the natural rays of radium should be employed in treatment. Hence, with present knowledge, the sale to the public of radium emanators and waters and of other appliances is harmful and may produce disastrous late effects. Indiscriminate rental of radium to physicians who have not specialized in this work is not conducive to the best results.

Ideas of treatment of malignant growths are changing. By using radium in a different manner than formerly, the attempt is made to smother or arrest the growth of carcinomatous cells, and to build up the inherent defenses of the patient; caustic effects are avoided. Many of the common types of carcinoma are amenable to treatment, especially if treatment is instituted early; other types are not affected. Even in the late stages of carcinoma, palliation can be accomplished by proper treatment.

Many benign tumors and inflammatory lesions are readily cured by treatment with radium; much progress is being made in this field, and it is increasing steadily.

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THE USE OF SPINAL ANESTHESIA IN GASTRIC CRISIS IN TABES DORSALIS*

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Very few human diseases have been subjected to the variety of therapeutic procedures that have been used for the relief of the gastric crises of tabes dorsalis. Gastric crisis constitutes one of the most serious accidents of tabes, and attempts at its relief run the gamut from stretching of the solar plexus,[3] to gastroenterostomy, to section of almost every nerve associated with the stomach or the chest wall. The non-surgical measures employed for its relief represent the acme of medical ingenuity. It is with some hesitation, therefore, that one offers any additional procedure for an already overburdened armamentarium; but the relief obtained by the use of a spinal anesthetic during an attack of gastric crisis seems to warrant this report.

SEMEIOLOGY

In order the better to understand the condition that we are treating, a very brief summary of the symptomatology of gastric crises is included here. There are three elements in the clinical picture, namely, pain, vomiting, and disturbance in gastric secretion.[1] These three symptoms do not always occur simultaneously, as there may be severe abdominal pain without vomiting. However, the vomiting is rarely without pain. The clinical picture usually develops suddenly and has no relation to the taking of food. It may come on when the stomach is full or empty, may awaken the patient from sleep, or may be precipitated by the taking of food. In one patient the intravenous injection of neosalvarsan precipitated an attack on several occasions. Like other tabetic pains, the attacks may occur in "bouts," the patient remaining free from symptoms for months or years, and then having a series of attacks lasting from a few hours to several weeks. That the pain is excruciating is attested by the large number of surgical measures that have been employed for its relief. Curiously enough, the symptoms usually cease as abruptly as they begin and whatever therapeutic agent is being employed at the time is enthusiastically hailed as a new remedy, and brilliant results are anticipated. However, no remedy heretofore suggested has brought relief *consistently in all cases.*

A sufficient number of patients have not yet been treated by the method I propose to enable one to say definitely that it will do what the others have not done. Nevertheless in view of the pathogenesis of gastric crises one may presume that the method suggested here is worthy of trial. If to some this report seems premature, possibly the fact that it is rendered only with the thought of stimulating further investigation along this line may militate against that impression.

PATHOGENESIS

Numerous theories have been propounded relative to the pathogenesis of gastric crises in tabes. The "central" theory of the Germans has been abandoned by many neurologists. The theory that the pain and vomiting are due to involvement of the vagus nerve lacks support in view of my results with spinal anesthesia. These results would seem to indicate the correctness of the theory of the dorsal origin of gastric crises.

Like other abdominal viscera, the stomach has a double nerve supply. Parasympathetic fibers reach it through the vagus nerve, and sympathetic impulses are conveyed to it by the greater splanchnic nerve. Each of these nerves has an afferent and an efferent component. The fibers comprising the greater splanchnic nerve are derived from the thoracic portion of the spinal cord, that portion from which arise also the intercostal nerves. The splanchnic fibers enter and leave the cord through the posterior roots of the spinal nerves. From the dorsal gray matter of the cord nerve pathways ascend to the motor vagus nucleus in the medulla oblongata, and from this nucleus motor impulses are conveyed to the stomach by the vagus nerve, completing the reflex arc. In Figure I stimulation by an irritative lesion such as occurs in tabes at A would cause impulses to ascend along the line designated by the arrow to the motor vagus nucleus in the medulla. From here impulses would be carried out over the vagus nerve to the stomach and cause vomiting. Furthermore, stimulation at A would also excite that region of the cord which gives rise to the intercostal nerves. This would account for the excruciating girdle pain accompanying or occurring independently of the vomiting in the gastric crises of tabes.

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*From the Department of Nervous and Mental Diseases, University of Minnesota, Ancker Hospital Service. Presented before the annual meeting of the Minnesota State Medical Association, St. Paul, May 24, 1932.

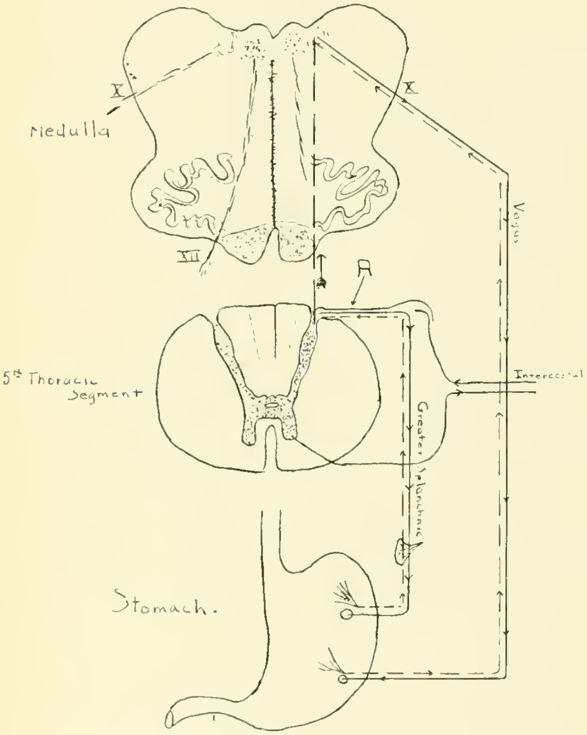

Fig. 1. The reflex of gastric crises (modified from Castelli and Tinel).

Any agent rendering the posterior spinal roots insensitive to the stimulation of an irritative lesion such as is seen in tabes, theoretically should relieve the pain and vomiting of gastric crises. This is what happened in the case treated in this manner by me.

CASE REPORT

Miss O. L., aged twenty-seven, was admitted to the medical service of Ancker Hospital, Saint Paul, on July 4, 1921, with family and past histories that were irrelevant to her complaints upon entrance. She stated that on March 24 she had for some unaccountable reason begun to vomit. This vomiting persisted for three or four weeks, was accompanied by severe epigastric pain, and did not bear any relation to food either qualitatively or quantitatively. In the early part of May she was operated upon by a local surgeon for a "tumor" in the left upper abdominal quadrant. This gave her considerable relief and she remained fairly comfortable until the early part of June, when the vomiting recurred and persisted until the time of the patient's admission to the hospital. Her physical and neurological examinations were recorded as negative. Roentgenograms and analysis of the gastric contents were negative and the attending physicians made a diagnosis of gastric neurosis. On July 13 she was discharged as improved.

On June 7, 1923, the patient was again admitted to the medical service with a recurrence of her former complaints. At that time it was found that her pupils were irregular and unequal, and that the knee jerks were absent. The Wassermann reaction of the blood was negative, but the cerebrospinal fluid was not examined. After three days of symptomatic treatment the patient was discharged as "improved" with a diagnosis of probable cholecystitis.

On August 16, 1926, the patient was again admitted to the medical service, stating that since her last admission she had had six or seven recurrences of her former trouble. Two years previously a cholecystectomy had been performed without any relief of symptoms. (This was the second laparotomy performed on this patient for a non-surgical condition.) Subsequent to the operation the patient began to attend the Wilder Dispensary in St. Paul, where a diagnosis of syphilis was made and treatment instituted. The patient took her treatments irregularly until her admission to the hospital. Ten days after entering she was discharged as "improved" with a diagnosis of syphilis and post-operative adhesions.

The next admission was on June 26, 1927, at which time the patient was transferred to the neurological service. Neurological examination showed Argyll-Robertson and unequal pupils. The knee and ankle jerks were absent, there was bilateral ataxia with lost deep pain sensibility, and a positive Romberg. Blood and spinal fluid examinations gave normal findings. (Patient had received considerable antileutic treatment at the Wilder Dispensary.) A diagnosis of tabes dorsalis with gastric crises was made and the patient was discharged on August 27th as improved. In view of the negative serological findings, further antiluetic treatment was not considered advisable.

The hospital records show that between January 7, 1928, and June 26, 1931, the patient was admitted to the hospital eleven times for the relief of gastric crises. Her average stay was 17.6 days and the average free interval between attacks was three months and ten days. The interval figure is not accurate because the patient had numerous attacks for which she did not enter the hospital. Recorded attacks occurred at intervals of as short as six days, while the longest free interval was eleven months and nineteen days. These figures are included for future reference in determining whether or not the treatment has any effect on the interval between attacks.

During the period referred to above, many forms of treatment were tried with varying results. On one occasion the attack was relieved by a hypodermic injection of morphine. Once it stopped after the administration of a hypodermic of sterile water. On two occasions spinal drainage seemed to give some relief, and on two other occasions there was no change in the patient's condition after spinal drainage. Once the attack ceased spontaneously when the patient was not receiving any medication whatever. During another stay in the hospital after spinal drainage had failed to relieve the patient, she was given frequent doses of pantopon hypodermically with no relief, and the attack stopped two days after all medications were discontinued.

On June 26, 1931, the patient was readmitted to the hospital having another gastric crisis which had been present for eight days. The neurological findings were the same as on the previous admission and the patient was markedly dehydrated. Dr. John Abbott of the surgical service was consulted and after discussing the case injected 2.0 c.c. of spinocain slowly into the lumbar subarachnoid space, using the customary technic. The head of the operating table was then lowered. At first there was no effect on the patient's pain and she went into a state of collapse. She became extremely weak, her pulse became rapid and of poor quality, and her respirations almost ceased. The head of the operating table was lowered still further and artificial respiration employed. Forty minutes elapsed before the patient was considered strong enough to return to her room. She then complained of excruciating pains in her feet. The pain gradually spread upward until it involved the entire body up as far as the chest, and it became necessary to administer a hypodermic injection of pantopon. The pains then subsided, the patient did not have any more vomiting and was discharged on July 3, feeling as well as ever.

On October 6 the patient returned to the hospital having another crisis, and she *asked for* another spinal anesthetic. Because of our previous experience with collapse, the patient was given 500 c.c. of a 5 per cent solution of dextrose intravenously before going to the operating room. One-half hour after an endolumbar injection of spinocain, the patient experienced relief from all symptoms. She was discharged in a few days feeling as strong as ever.

On December 12, 1931, at 2 p. m., the patient was given another injection of spinocain for gastric crisis by the intern, Dr. C. E. Watz. His notes are as follows:

2:30 p. m. Patient feels fine—smiling. Blood pressure, 118/78. Pulse good. Patient is very well pleased with treatment, having had no reaction this time.

Dec. 4. Had some pain in toes and calf muscles last night. This has gone away and patient asks for more food today. No nausea or vomiting. Blood pressure, 140/98.

Dec. 5. Patient feeling very well. Receiving supernourishing diet. No pain, very cheerful.

Dec. 6. Able to eat everything. When up yesterday had some nausea and distress but no pain.

Dec. 8. Normal yesterday. This morning had some nausea. Ate breakfast but vomited it. No pain. Has eaten rest of meals. Feels fine.

On December 14 the patient was discharged from the hospital and has remained well to date.

POSSIBLE DANGERS OF THE TREATMENT

Shock.—This occurred with our first treatment when the patient was very much dehydrated. However, if fluids are given intravenously before the injection of a spinal anesthetic the danger of shock from our procedure should not be any greater than in other conditions for which this form of anesthetic is used.

Damage to the Spinal Cord.—Loyal Davis and his associates[2] injected spinocain into the spinal subarachnoid space in a series of dogs and then examined the spinal cords at varying intervals after the injection. They found changes in the meninges, the anterior horn cells, and in the myelin sheaths at the periphery of the cord. However, the changes in the anterior horn cells and the myelin sheaths were not as pronounced in cords examined ninety days after injection as in those examined earlier. This would indicate that these changes are not permanent. The meningeal reaction was marked only in those animals receiving massive doses of spinocain in comparison to their body weight.

However, in spite of the fact that normal cords probably do not receive any permanent severe damage from the injection of spinocain, one hesitates to bring any foreign substance into contact with a spinal cord that has been already damaged by a pathologic process. Just what effect spinocain has on the cord of a patient suffering from tabes dorsalis is at present unknown and the matter demands further investigation.

LIMITATIONS OF THE TREATMENT

Spinal anesthesia is *not a cure* for the gastric crises of tabes. The best that we can hope to do is to relieve the single attack. Since some cases respond to other forms of treatment (spinal drainage, malaria, pituitrin, sedatives) the procedure suggested is not indicated in every case. It is to be used only in those cases in which the patient's condition has become serious and in which other attempts at relief have failed. In patients having attacks of gastric crisis of unusual severity but at infrequent intervals, spinal anesthesia also might be indicated.

SUMMARY

1. Gastric crisis is one of the most serious accompaniments of tabes dorsalis.

2. Innumerable surgical and medical procedures have been used for its relief with inconsistent results.

3. Spinal anesthesia promptly stopped an attack of gastric crisis on three different occasions in the same patient.

4. If one accepts the theory of the dorsal origin of gastric crises in tabes, the rationale of spinal anesthesia in this condition becomes clear.

5. Possible sources of danger and the limitations of the treatment are mentioned.

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SODIUM AMYTAL ANESTHESIA IN OBSTETRICS*

A REPORT OF ITS ORAL AND INTRAVENOUS USE IN SEVENTY-EIGHT CASES

James J. Swendson, M.D.
Saint Paul

THE progress made in safely relieving the sufferings of obstetrical patients has not kept pace with the progress of pain relief in other fields of medicine. The employment of analgesic and anesthetic agents during labor necessitates the safeguarding of the lives of both the mother and her unborn child. It is a more complicated and individualized problem than that met with in general surgery. Nevertheless, an increasing number of women nowadays are refusing to submit to the sufferings borne by their mothers and grandmothers. Safe methods of relieving pain, therefore, merit our attention even though they entail the expenditure of additional time on the part of the medical attendant, require skilled nursing assistance, and add to the patient's expense.

During the past eight years numerous experimental and clinical observations have been made on the barbituric acid derivatives so that our knowledge of their pharmocologic effects has become quite clearly defined. Sodium amytal (sodium iso-amyl-ethyl-barbiturate), which has been most widely studied and used, was first recommended as a general anesthetic, but later was found to be more suitable for use as a basal anesthetic agent to be followed by the administration of an inhalation anesthetic.

A year and a half ago I reported a series of forty-six cases in which sodium amytal given intravenously and supplemented by an inhalation anesthetic was used to alleviate pain during labor.[4] The present paper attempts to record and evaluate in seventy-eight cases some of my further experiences with the drug administered intravenously in some patients, orally in others, and by both routes in the remainder.

Intravenous Administration. — In forty-six cases of the present series, when labor was well established as determined objectively by 4 or 5 cm. dilatation of the cervix and regular uterine contractions occurring every four or five minutes, or subjectively in multiparæ by complaint of active labor pains, a clear, freshly prepared 10 per cent solution of sodium amytal was injected into a vein in the arm at a rate not exceeding 1 c.c. a minute. Slow injection of the solution was considered to be exceedingly important, for it has been shown experimentally by Swanson and Shonle[3] that the rate of injection appears to control the intravenous toxicity of the drug, and it recently has been demonstrated clinically by Ruth and Paxson[2] that while analgesia is quickly produced by rapid injection, it soon wears off so that the desired effect is lost. The first dose ranged from seven and one-half to ten grains determined somewhat by the body weights of the patients, but largely by their responses to the medication during injection. They became drowsy when four and one-half to six grains had been given and were soon sound asleep, failing to respond to questioning and often breathing somewhat noisily. One and one-half to four grains more of the drug were then given before the needle was withdrawn from the vein. When contractions occurred during administration, injection was temporarily stopped because the patients usually became restless and attempted to move their arms. In twenty-six cases (56.5 per cent) of the intravenous group a single dose of seven and one-half grains was given one-half to five hours before delivery, the average time being one and three-fourths hours. In the twenty other cases (43.5 per cent) of this group a second, or even a third, dose ranging from five to seven and one-half grains was administered at average intervals of two and one-half hours, but sometimes at intervals as short as one-half hour or as long as four or five hours, depending upon signs of returning consciousness, such as rational responses to questions and complaint of severe pain. If delivery was imminent, however, the drug was not repeated, but nitrous oxide anesthesia was started at once and given during contractions or operative procedures until labor was terminated. Total intravenous dosage in the twenty cases receiving two or three injections frequently was fifteen grains but never exceeded twenty grains.

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*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

Oral and Combined Administration.—In thirty-two cases in which administration of the drug was started orally, various methods were tried, but one of the two following methods was usually carried out. Capsules containing three grains of sodium amytal were given at one-half hour intervals early in labor until nine to fifteen grains had been given; or nine, or sometimes twelve, grains were given in a single dose when labor was well established. Whichever method was followed, smaller doses of three or six grains occasionally were repeated at one to three hour intervals when consciousness appeared to be returning, but a total oral dosage of more than eighteen grains was never given.

Of these two methods, the second one gave more satisfactory results. The first method of giving small, divided doses was thought to be particularly suitable for longer primiparous labors, but it often failed to give satisfactory relief because of rapid progress of the labor and was abandoned for intravenous administration of five to seven and one-half grains after three to nine grains had been given by mouth. In all, eleven, or about one-third of the thirty-two cases in which oral administration was started, were also given intravenous sodium amytal, the total combined dosage ranging from ten to twenty-one grains.

Clinical Observations.—Amnesia was the most gratifying effect of the medication. Of the forty-six patients receiving only intravenous medication, thirty-two (69.5 per cent) had complete amnesia for their labors following administration, fourteen (30.5 per cent) had partial amnesia, and only three of the latter remembered a great deal about their labors or were so dissatisfied with the relief obtained that they could be classed as failures. Of twenty-one patients who received only oral medication, ten (47.6 per cent) had complete amnesia and eleven (52.4 per cent), partial amnesia beginning one-half to three-fourths of an hour after a single large dose or soon after receiving the third three grain capsule. In the complete series, the period of the amnesia often lasted as long as three or four hours after labor when the last dose of the drug had been given within an hour before delivery. Patients who received the last dose of the drug more than two hours before delivery and who received ten grains or less, were usually conscious and co-operative at the end of labor.

Restlessness during contractions or when the patients were disturbed was the most objectionable feature of the medication. While fewer cases of marked restlessness were noted than in my first series, thirty-six (56.2 per cent) out of sixty-four in which this symptom was recorded on the charts were restless enough to require constant watching, eighteen (28.2 per cent) were only slightly restless, and ten (15.8 per cent) were quiet. The route of administration did not seem to bear any relation to the degree of restlessness. The temperaments of patients were, however, important factors, nervous and excitable patients much more frequently exhibiting restlessness than calm, even-tempered ones. Patients were quiet after delivery and usually slept for several hours.

Blood pressure readings during intravenous administration were not made routinely. In the few cases in which they were observed, the systolic pressure was found to drop 15 to 20 mm. of mercury, and the diastolic pressure 10 to 15 mm. during administration. The pressure gradually rose after the injection was finished and was normal again in one-half hour.

No slowing of labor was observed. On the contrary, labor in at least one-half of the multiparæ was accelerated so obviously that nurses on the obstetrical floor soon learned to make preparations for taking the patient to the delivery room whenever intravenous sodium amytal was given to a multipara in active labor. This shortening of labor is probably due to relaxation of the cervix. Ruth and Paxson[2] call attention to the phenomenon in a recent paper and consider the intravenous administration of the drug to be of value in treating dystocia due to a spastic cervix or a retraction ring.

After patients were under the hypnotic effects of the drug, it was necessary to encourage them to take sufficient fluids. Also, as one would expect, voluntary voiding of urine was often omitted and catheterization frequently became necessary. No post-partum complications could be attributed to the medication.

Although mild apnea of infants at birth was frequently observed, there were no cases of true asphyxia which could be attributed to the drug in this series. Fetal heart rates during labor were not altered. Nursery attendants noted that about three-fourths of the infants were sluggish at breast for thirty-six to forty-eight hours after birth, and required coaxing and the additional expenditure of time in giving them complementary feedings, but no further effects of the drug could be correlated with post-natal behavior or weight curves.

Discussion.—Considering uniformity of action and the amount of relief obtained by the patient as criteria, a comparison of the results obtained in intravenous and oral administration indicates that the former route was more satisfactory in this series of cases. Intravenous administration has certain disadvantages such as its inherent technical difficulties and the dangers from too rapid administration. Theoretically there are also the possibilities of acute respiratory and circulatory depression and the dangers of disturbed "intravenous reflexes" which have been stressed in a recent report on the intravenous administration of barbiturates by the Council on Pharmacy and Chemistry of the American Medical Association.[1] With the smaller doses administered in obstetrics, ranging from 7 to 15 mg. per kilogram as compared with the doses of 12 to 25 mg. per kilogram formerly given in general surgery, I have neither encountered any of the dangerous complications warned against, nor would I expect them to occur except possibly in asthenic individuals with low blood pressures. Some of the advantages of intravenous administration are that the effect of the drug is immediately obtained; that the minimum amount required for the individual patient can be judged with a fair degree of accuracy; that elimination and destruction of the drug in the body is rapid.

Oral administration includes among its disadvantages difficulties of determining individual dosages and the possibility, as Zerfas[5] has pointed out, that "the peak effect of the drug may not be obtained when desired." It has the advantages of easier technic and less acute respiratory and circulatory effects. Also, the drug can be given earlier in labor, and if satisfactory results are not obtained from oral administration it can be supplemented by smaller doses intravenously. Oral administration yields its best results in long primiparous labors while intravenous administration is more satisfactory in rapid multiparous labors or when used for patients first seen late in labor.

CONCLUSIONS

1. The intravenous administration of comparatively small, individualized doses of sodium amytal gives more uniform and satisfactory pain relief during labor than when the drug is given orally.

2. Oral administration of somewhat larger doses, however, because of its simpler and safer technic should be used whenever possible since it can be supplemented by intravenous injections of the drug if satisfactory relief from pain is not obtained.

3. Either method of administration, when supplemented by an inhalation anesthetic, produces gratifying amnesia and safe and adequate relief from pain during most labors.

4. Neither the oral nor the intravenous methods of administration produce deleterious effects on the babies.

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OVER PRODUCTION?

"The number of physicians in France continues to increase faster than the population."

"In Hungary the number of physicians exceeds 8,000, which is too many."

"The new medical students (in Germany) enrolled for the past few years have greatly exceeded the estimated number of assimilable young physicians. It is evident that, during the past three years, 7,800 more medical students than needed have received training.

The sentences quoted above are taken from letters from Berlin, Budapest and Paris and are repetitions of statements that have appeared very frequently within recent years.

In 1900, with horseback and horse-and-buggy transportation, with few telephones and with certain diseases very prevalent that are now comparatively rare, the medical schools of the United States turned out 5,214 graduates. In 1930 less than half as many schools produced 4,565 young physicians. In the meantime there has been almost unbelievable improvement in transportation and in all the facilities of communication and there has been a remarkable diminution in the prevalence of certain diseases that formerly kept physicians busy. In the meantime, also, the number of hospitals has increased tremendously. While comparatively few of the graduates of the schools of the United States go to other countries, a very considerable number of the graduates of the medical schools of other countries come to the United States, year after year. Approximately 3,000 physicians die in the United States, each year. It is estimated that the population of this country will be "stabilized" within a few years. There is 1 physician for each 780 of the population. In 1931 there were enrolled in our medical schools 385 more students than in 1930 and the number of graduates increased by 170.

In a little booklet called "Notes on Legal Education," published by the Section of Legal Education and admissions to the Bar of the American Bar Association, some very interesting figures are presented and some very pertinent questions are asked. In the ten years from 1920 to 1930, according to this booklet, approximately 78,500 new lawyers were admitted to practice in the United States. It is estimated that the number of lawyers who die and the number who withdraw from practice each year together make 4,600, while in the year 1931 about 9,700 were admitted to practice, so that the committee that prepared the booklet has concluded that more than twice as many lawyers are being produced than are needed. The question is asked, "Is it not time to take some steps to reduce this flood tide?"—*A. M. A. Bulletin,* June, 1932.

VOICES ACROSS THE RIO GRANDE

Station XER, just across the Rio Grande from Del Rio, Texas, is the mouthpiece of John R. Brinkley, goat gland transplanter, mail-order dispenser of medicines and candidate for Governor of Kansas. The station has apparently been authorized by the Mexican government to increase its power from 75,000 to 500,000 watts, which, it is stated, will make it ten times more powerful than any station in the United States. The government of the United States stopped his broadcasting in Milford, Kan., and he built the station in Mexico to get around that prohibition. Experts in radio engineering indicate that the use of a current of such potency by the Brinkley station will interfere seriously with any station in the United States operating within 50 kilocycles of that used by the Brinkley station. Apparently, Brinkley can put potency into his radio broadcasting even if the goat glands will not perform a similar function for the misguided octogenarians, or instances of sexual impotency, psychic or otherwise, induced to submit to grafting operations by what they hear from over the Rio Grande. A letter just received by the American Medical Association from the Camara Nacional de Comercio de Nuevo Laredo indicates that Cancer Quack Norman Baker contemplates building a station at that place, presumably to promote the industry formerly exploited through his station in Muscatine, Iowa. It should be obvious to any one that the purpose of these stations on the Mexican border is to invalidate the attempts of the Federal Radio Commission to keep clean the material coming through radio channels into this country. If this Mexican practice is to continue without interference, American users of the radio may well anticipate for the coming years as the dominating theme of the broadcasts to which they may listen the lamenting and feeble baa-baa of the castrated goat and the blatant charlatanism of Norman Baker. (Jour. A. M. A., October 15, 1932, p. 1355.)

PRESIDENT'S LETTER

DECEMBER is here again; the year 1932 will follow its predecessors shortly. It has been much the same as 1931, with the exception that the ravages of the depression are even more apparent. The coming winter, in spite of the fact that there appear some hopeful signs on the horizon, is likely to be hard on a large percentage of our population. The medical profession will be called on to make even greater sacrifices, and to provide care for even more people, without remuneration, than before. This has been cheerfully done before and will be done again, but the inequality of this increasing burden is being more and more recognized by thinking people. We may expect various plans to be brought forth by the laity, some of them altruistic and unselfish, others will be tinged with selfishness, and perhaps some few with actual malice toward our profession. Organized medicine must have its own plan to meet those proposed, and must not swerve from the principles of its code of ethics, proved by time to be of advantage to the public and to the profession. The year 1933 is a legislative year in Minnesota and we, as a component of organized medicine, must see to it that we are faithfully represented to protect not our own interests so much as to protect those of the people, our patients. The lack of party system and the use of the so-called nonpartisan method in our state legislature makes it difficult to determine just who is backing the various measures that are brought up. Fortunately we have a man at the head of our Committee on Public Policy and Legislation, Herman Johnson, who has an uncanny sense in detecting the source and purpose of the various measures that are proposed. Our Legislative Committee has asked of our legislators only those things that are best for, and that are in the interest of, the public, and has never asked for anything primarily for our own benefit. This committee is today perhaps the most important one that we have in our state association and we are fortunate indeed that such men as Herman Johnson and Ben Wright are willing to give so freely of their time and talent. They, with the other members of this committee, are our leaders in these matters, and we must look to them for guidance and give them our full support.

This is the last of my monthly letters. To have served as your president for the past year has been an honor, a pleasure, and a privilege. As I have journeyed about the state and met many of our members, I have been impressed by their interest, earnestness, and broad grasp of medical matters. I wish to pay tribute also to our secretary, Dr. E. A. Meyerding, and his staff. A visit to our headquarters at 11 West Summit Avenue, St. Paul, is well worth the time of any member of the association. There will be seen a busy office force, engaged in furthering and protecting the health of the people of our state. The rare but happy combination of a state medical society working hand in hand with a state public health association is there encountered, and its mutual advantages are more readily appreciated. Under a common secretary, the activities of both associations are accomplishing far more than we realize. As I look back on the past year it stands out vividly in my mind as a most pleasant one on account of the many renewals of old friendships that I have made, and I hope the establishment of new ones. I pass the torch to our new president, Dr. N. O. Pearce, wish him Godspeed, and say to you all, "au revoir."

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

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SAINT PAUL'S GROUP HOSPITALIZATION PLAN*

Today the cost of hospital care for the average employed man or woman is serious, and the vast majority of gainfully employed persons find it difficult, if not impossible, to meet the cost of illness. Because the hospitals of Saint Paul believe there is an opportunity for them to provide scientific service to respective social classes who can budget their incomes to provide periodic payments of small sums to insure hospital care when it is needed, they propose to organize, for full or part-time employed persons, a group hospitalization plan whose fundamental principle is to provide hospital care for twenty-one days each year to its members for a fee of seventy-five cents (75c) per month, or nine dollars ($9) per year. Thus, the hospital bill will be carried by a group rather than an individual.

Such an organization will be called "Hospital Service, Incorporated," and will be controlled by the participating hospitals through a Board of Trustees composed of one board member and the superintendent of each participating hospital. Thus, there will be eliminated the possibility of abuse by either an individual or by a commercial organization, such as those who are promoting various hospitalization plans throughout the country and whose sole interest is monetary. All benefits derived from the plan proposed for Saint Paul will be given to the patients and the participating hospitals.

There is no thought of profit-making in this plan, but only to collect sufficient funds from the groups to cover the actual cost of hospital care for those members who need hospitalization. Nor should this be interpreted as an insurance plan, as it offers only hospital service to patients under physicians' care. Such a plan in no way competes with the physicians' professional services.

To establish and make workable this group hospitalization plan it will be necessary to obtain three to five thousand members, then the law of average will apply safely, although the memberships at no time will exceed the margin of the number of unoccupied beds of the participating hospitals.

The organization will deal with groups, not individuals. Each member will be given full liberty in the choice of one of the participating hospitals, as well as his choice of physician, provided the latter is in good standing and acceptable to the selected hospital.

The membership fees will be collected by payroll deduction and paid to the Hospital Service, Incorporated, which will in turn reimburse the hospitals for their services.

To each member, in case of illness necessitating hospitalization, will be furnished hospital care, including board and accommodation in a ward bed (although he may have private or semi-private room accommodation by paying the difference between the two, less a discount of 25 per cent); operating room service, anesthetics; general nursing, including undergraduate and graduate staff; service of dietitian; clinical laboratory service to the amount of $15; X-ray to the amount of $15; routine medicines, hypodermics; surgical dressings, and all other usual hospital services.

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*The idea of this group hospitalization plan did not originate here. Somewhat similar plans are now in operation, or in the process of organization, in the larger cities throughout the country.

In case hospitalization beyond the number of days allowed is required, service will be furnished at the regular rate, less a 10 per cent discount, for a period not exceeding ninety days.

Hospital service required when a member is not confined to the hospital will be furnished at the regular rate, less a 10 per cent discount.

Services not furnished are those of the physicians, surgeons, and special nurses; nor are special nurses' board and special prescriptions supplied.

A member will be given hospital service only on the recommendation of his physician who is a member of the medical staff of the selected hospital, or who is acceptable to the selected hospital, and only during such time as he is under treatment and care of such physician. He is to leave the hospital when discharged by his physician; otherwise, he will be requested to pay in cash full hospital charges for services received after advisement that further hospitalization will be unnecessary.

Hospital service will not be furnished in cases of injuries covered by employers' liability insurance, as outlined in compensation laws of the State of Minnesota, or automotive liability insurance; or, except for preliminary hospitalization pending diagnosis, in cases of mental diseases, contagious diseases or tuberculosis.

Hospital service for dependents of members will be furnished at a discount of 10 per cent from the regular hospital charges, not to exceed a period of ninety days.

However, the hospital service is not given to members who become victims of an epidemic or public disaster, but, in case of epidemic or public disaster which occasions the over-crowding of the capacity of the contracting hospitals to such a degree that it is not possible to provide accommodations to ill group members who are not victims of the epidemic or public disaster, and in case adequate accommodations cannot be secured in other hospitals of the plan, the Hospital Service, Incorporated, will refund to the member the full amount paid by him during the then current year; provided, of course, services have not been secured from any one of the participating hospitals, in which event a proportionate amount of fee paid will be refunded and such payment will constitute a full and final discharge of the obligations of the participating hospitals.

To the physician such a plan offers the preservation of the personal relationship between him and his patient; diverts to him money, in payment of his professional fee, which otherwise might have been expended for hospitalization; and retains for him private patients who, because of limited finances, otherwise might have been forced to become charity cases.

To the hospital, now running only 50 per cent capacity at a loss, the plan not only guarantees an increase in the hospital's daily census, thus enabling it to use its facilities to greater advantage at a lower cost; but guarantees a fixed revenue, thus assisting in the solution of the problem that threatens the continued and efficient hospital service already weakened by decreased gifts, inadequate support from the city, and increasing demands for treatment on the part of those who can pay little or nothing.

To the community it offers the opportunity in great part to provide against the financial hazards of illness by shifting the burden of the cost from the individual to a group; and many people who now find it necessary to accept charity will, under this plan, become private patients, thereby reducing the enormous amount of charity work demanded of the city.

To the individual, who, under ordinary circumstances remains at home during an illness, quite often without benefit of a physician's care, because of a limited income, it means efficient hospital care, with early diagnosis, proper treatment, et cetera; thus oftentimes saving him from a fatal termination, and in a great majority of cases returning him to his work at an earlier date.

It is sincerely believed that the group hospitalization plan will furnish a bulwark against other radical trends that might revolutionize the practice of medicine. It is not believed, however, that this plan is a panacea, but it appears to offer, particularly at this time, the greatest promise of deliverance from our economic distress and assist in assuring future financial stability of the hospitals.

Peter D. Ward, M.D., and
A. M. Calvin

FINAL REPORT OF THE COMMITTEE ON THE COST OF MEDICAL CARE

The final report of the Committee on the Cost of Medical Care will have been made public at a meeting in New York City on November 29. Through the courtesy of the Committee opportunity was granted for a perusal of the report in advance.

The Committee has completed a vast amount of work at great expense and has succeeded in gathering a wealth of valuable statistics. These statistics, although they refer in large part to pre-depression days, should be of great value in an attempt to solve problems involving economic phases of medical practice.

The Committee felt justified in making certain recommendations. Those regarding more Public Health activities, the training of more medical students to fit them for public health activities, the restriction in the number of specialists in medical practice, and the establishment of standards and control of specialists, met with general approval on the part of the Committee. All seemed to agree on the important and essential part played by the general practitioner in medical practice.

As to some of the main recommendations in the majority report there was a marked divergence of opinion which was strongly expressed in the minority report. The majority thinks that group practice preferably built around a hospital as a unit will help to solve the problems of better medical care at less cost. The minority report calls attention to the disadvantages of group practice and states the belief that the increase in medical groups will put the individual practitioner out of the running, especially if insurance as a solution of the unequal distribution of medical costs becomes generally adopted. The minority sees in group practice an attempt to apply the method of organization and mass production to the practice of medicine, which is so necessarily individualistic.

Another main recommendation of the majority is the advocacy of insurance to provide the necessary and ideal amount of comprehensive medical care which includes doctors, dentists, nurses, hospital care and drugs. The report brings out very well that the cost of comprehensive medical care evenly distributed, estimated at twenty to forty dollars per individual per year or 100 to 200 dollars per family of five, is more than the 50 per cent of families with $2,000 or less annual income (1928 figures) can or will voluntarily budget or insure against. Universal insurance would therefore necessitate compulsory insurance and assistance from taxation. The minority points out the evils which are sure to accompany the general adoption of insurance and group care.

Contract practice in general receives considerable attention in the report. The dangers inherent in such wholesale practice are likely to result in putting the practice of medicine on an entirely money basis, with cut-throat competition by individuals or groups and resulting inferior work.

The report as a whole deserves careful consideration on the part of the medical profession. Doubtless it will receive great publicity. If it results in widespread insurance by private companies or the state and if group practice of one kind or another increases, present day methods of medical practice will be greatly affected. There are many dangers in the proposals made in the majority report.

Private individualistic practice has stood the test of time. We know the dire experience of European countries with state insurance and its inferior service and doubling of disability from sickness. While contract practice in itself is not necessarily bad and in fact is the only way medical service can be supplied in certain localities, we know the inherent evils often manifest.

Each state or county society is likely to have to decide on the advisability of adopting proposed innovations in medical practice. Many have already been called upon to act in regard to insurance and contract proposals. In some the insurance rate has been so ridiculously low and compensation to the physician so meager that medical societies have not hesitated to disapprove.

As a result of the present depression and perhaps as a result of the Committee report impetus will be given to new insurance schemes involving group and contract practice. It will behoove each medical society to be on the alert to consider carefully the effect of such proposals on the quality of medical care which will result.

Most physicians, we believe, favor the general principle of insurance to cover medical costs. Universal insurance is perhaps too Utopian. Any scheme whereby all the people will be provided with the best medical care is perhaps too idealistic. Certain insurance projects such as the one being put into effect in Saint Paul to cover hospital costs should be encouraged. An organization similar in character to provide insurance to cover fees and operated by a county medical society as outlined in the minority Committee report merits careful consideration.

PSITTACOSIS IN MINNESOTA

On several occasions since 1904 a few sporadic cases of psittacosis have been reported in the United States. The appearance of 185 cases with thirty-five deaths in fifteen states in 1929-1930 traceable to imported parrots led to an embargo being placed on these birds on January 24, 1930. In January, 1931, cases of psittacosis were traced to contact with sick "love birds" brought in to New York from Cuba, and again in October, 1931, a few cases in New York were traced to parrakeets shipped from San Francisco, some of which had been imported from Japan. In December, 1931, four fatal cases occurred in California, traceable to infected parrakeets, and since that time some forty-three cases have been reported in California. There is evidence that the home bred birds in California are now infected.

Psittacosis appeared in Renville County, Minnesota, last September and since then some nineteen cases definitely so diagnosed and an additional eight suspected cases have been detected in the state. All the cases are directly or indirectly traceable to a shipment of infected "love birds" received in Olivia, August 1, 1932, from an infected aviary in California. Seven of the known cases were found in Renville County, nine in Sibley County, and one each in Goodhue, Nobles and Hennepin Counties. The sale of these "love birds" at numerous county fairs has provided the channel for possible widespread dissemination of the infection.

It is well, therefore, for the profession to be psittacosis minded. The symptoms are said to resemble those of an influenza with atypical pneumonic symptoms. The infective organism is unknown. The incubation period is about six to fifteen days and the high mortality increases with age. The onset occurs with fever, which may reach 103 to 105 degrees during the second week. The pulse is rather slow, as in influenza. Nosebleed is not uncommon. The cough is inclined to be non-productive and blood streaked sputum is absent. Leukopenia is the rule. The febrile period may last from one to three or more weeks. Relapses are not infrequent. Phlebitis is the most frequent complication.

The disease is spread in the main by members of the parrot family which either have or have had the infection. It has also been proven that psittacosis patients spread the disease and so should be quarantined and nursed like individuals with other infectious diseases. No diagnostic tests have been evolved and no specific treatment devised. Suspected cases should be reported at once to the Division of Preventable Diseases, Minnesota Department of Health, University Campus, Minneapolis (Telephone: Dinsmore 2760).

CHRISTMAS SEALS

The alliance between the State Medical Association and the Christmas Seal is well cemented in Minnesota. For years, the Christmas Seal program has been subject to approval of the proper state society committees and has consequently been directed into ethically and medically sound channels.

The campaign of 1932 will have an unusual endorsement from the medical profession, however, because it is of unusual importance to all of us to promote all possible activity in the fight against tuberculosis this year.

Recent very interesting studies coming out of Germany have shown the serious late effects of malnutrition among young children. The babies of Germany who all but starved during the hard times immediately following the war are now approximately 17 and 18 years old. They are physically and mentally under par in spite of the fact that many years have intervened, now, since the starvation period. Their resistance to disease, notably to tuberculosis, is very low.

The application to our own situation in America is obvious. It is clearly up to all of us to protect the babies of from one to five years of age. They must have proper food, and, equally important, they must have all of the health protection that we can create for them.

The educational program of the Christmas Seal organization is essential to this protection. If every man and woman can be made to realize the danger to their children of contact with tuberculosis, there will be fewer infections among the children of today to lead to fatal cases of tuberculosis in young man- and young womanhood.

Demonstration through the schools of the diagnostic value of the Mantoux tuberculin skin test with X-ray is an important part of the modern Christmas Seal program. It is indispensable to an enlightened public health program in these times. Properly used, it is capable of doing much to prevent a serious rise in morbidity and mortality rates from tuberculosis as a late consequence of the depression in the United States.

CORRECTION

Our apology to Dr. John L. Montgomery, formerly of Minneapolis and now located in San Francisco, for our error in announcing his death in the obituary column of the August, 1932, number of Minnesota Medicine. Our error was the duplication of the same error on the part of a newspaper, and in the words of Mark Twain the rumor was grossly exaggerated.

We are reminded of the story of the Yankee in a small town in Massachusetts who made a small loan to a fellow townsman, who promised to pay it back in three months if he was still alive. The expiration date came and the loan had not been paid back. Reasoning that his fellow townsman, being a man of his word, must be dead, he circulated a report to that effect. Relatives flocked to town to render final tribute to the deceased only to find an infuriated and much alive relative.

The journal does not indulge in practical jokes, but occasionally we receive and repeat news which lacks foundation and on such occasions we are only too happy to correct the error.

FEEDING FORMULAS FOR INFANTS IN LAY ADVERTISING

The Committee on Foods reports feeding of an infant by routine feeding formulas and instructions distributed by food manufacturers, or according to directions, printed material, or advice of any person other than the attending physician who can personally observe the condition of the baby, may seriously endanger the health of the infant, and is considered to be in conflict with the best experience, authoritative judgment, and basic principles in infant feeding and is not permissible. No objection is taken to published directions for the preparation of mixtures for use in infant feeding. (Jour. A. M. A., July 30, 1932, p. 391.)

MISCELLANEOUS

SOCIAL INSURANCE (Conclusion)

Edward H. Ochsner, M.D.
Chicago

The purpose of this series of articles on Social Insurance has been to arouse the rank and file of the medical and dental professions and, through them, if possible, the general public, to an impending danger; and to dispel a number of quite generally held false opinions.

The first of these is the very commonly held belief that the moment a professional man assumes a title and a government position he knows more and becomes more efficient than he ever was before, while the contrary is more often the case because of the enervating effect of red tape and paper work.

The second common error is that, by some magic, Compulsory Health Insurance is going to escape the favoritism, nepotism, graft and in fact all of the evils of politics. This is a delusion with which reformers and the intelligentsia in general are commonly afflicted. The practical man of affairs and particularly the seasoned politician does not fall into this error. Some time ago during a heart to heart conference a practical politician said what he really felt and knew to be true. He said in substance that we must remember that "We have government by politics, and you and I or all of us with a hundred thousand others cannot change this situation. I do not care whether you remove the control from the city to the state or to the federal government, it will still be controlled by politics."

The third common error again held particularly by the reformers and intelligentsia is that statisticians and economists can solve this problem unaided. Desirable, valuable and even necessary to a complete understanding of the problem as a study by competent economists is, there is one very important fact which many who have made a study of the problem do not seem to be able to realize—namely, that in a matter where personal relation is such an important element as in the practice of medicine and dentistry the ordinary formulæ employed by economists do not and cannot apply. Personal relations cannot be measured by any mathematical formula devised. It is too elusive a factor to be measured by monetary or any other standards and yet of all the factors it is by all odds the most important. Only the individual who has had an extensive experience in the practice of medicine or dentistry or the one who has had a long and serious illness seems to be able to evaluate properly this phase of the problem. Then again the lack of medical knowledge by economists makes it impossible for them to appraise the difference between the personal individual care of the patient by the private physician and the more or less impersonal mechanical care of the panel or Krankenkasse physician; nor are they so situated as to have access to individual patients, and even if they had they lack the training to know which is giving the better treatment. From the foregoing it must be evident that this type of study and investigation has its limitations in cases where the personal element enters intimately with a social or economic problem and if too much dependence is put upon it wrong conclusions are bound to be reached, or, to re-state this point a little more concisely, let us say that statistics have their value and their limitations. The more personal the matters under investigation the less their value and the greater their limitations. One writer has expressed this idea very well in the following words: "There is real danger that the economist lost in the abundance of his researches finally overlooks the plain and easy road that lies directly before him."

Probably the most common error is the belief that Social Insurance will abolish poverty. To the contrary, it is at best only a palliative and, like all palliatives, if employed for any considerable period of time always leaves conditions worse than when first employed.

Another common error quite generally made by the more sensitive and emotional is to believe that the receiving of charity is of all things possible the most degrading. Serious as the accepting of charity is to the character of the intelligent and sensitive, there are many other things even worse and one of these is the quite general practice of malingering which Compulsory Health Insurance and the Dole encourage and foster among the workers of a nation. There is this fundamental and very important difference between accepting charity and a health insurance stipend—the former is still considered somewhat of a disgrace while to get the latter, even through subterfuge, is considered highly respectable and clever.

There are two questions that the Compulsory Health Insurance proponents have never answered in spite of the fact that they have offered innumerable alibi that do "not alibi" and endless explanations that do not explain. First, why, if Compulsory Health Insurance improves the health of a nation as claimed by its proponents, is the death rate no lower in those countries that enjoy this "great blessing" than in those countries not so blessed? And, second, why, shortly after and since the introduction of Compulsory Health Insurance, have the number of days lost by the workers per annum steadily increased? The answer to the first question is that it does not improve the general health of the people and the answer to the second is that among a very large percentage of the working population it substitutes for *the will to get well and the will to work, the will to stay sick and the will to loaf.*

Personally I am quite satisfied that Germany and England should make their experiments in Social Insurance and Russia her experiment in State Medicine but I am happy that these experiments are being made three and four thousand miles respectively from our shores. I am firmly convinced that if we can stave off these schemes for another ten years we will be spared them because they will prove so harmful to medical practice and medical progress and so destructive to national character that we will escape their blight. Time will demonstate that they are fundamentally wrong, a backward step in civiliuzation.

Human progress in most lines has always been very largely the result of unhampered personal endeavor and rarely if ever the result of governmental action primarily. Will we never be able to learn from experience and must there always be recurrent periods of halt and even retrogression in human progress?

American medicine and dentistry stand today at the threshold of their greatest opportunities and beside the abyss of their greatest dangers; the former because of their marvellous advances in the recent past, the latter because they are being pestered and annoyed by a small but vociferous group of misinformed, uninformed, unwise and in a few instances self-seeking, selfish, self-appointed lay advisers. There are troubled times for these two allied professions; the men who stand firm now will deserve the gratitude of future generations of men and women.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

The reasons why the average physician joins his medical society are numerous. They are based on a mixture of professional, social and economic motives. Generally he is a member for much the same mixture of reasons that he is a physician. The one follows upon the other.

Sometimes, however, it is important to dwell particularly upon one or the other advantages of membership. It is important especially in these times when every dollar spent, whether for dues, food, clothing or entertainment, is carefully weighed. It must be possible to show, in such times, that even so customary and accepted an obligation as medical society membership pays specifically in dollars and cents.

The advantage of society membership on the professional and scientific standing of the physician may be taken for granted. It is easy to overlook the very worth while advantage that membership in good standing has upon the physician's financial condition, generally, and particularly upon his insurance ratings.

A case in point is furnished in extracts from a letter written to F. J. Savage, St. Paul, Councilor of the Fifth District, by T. E. Haberkorn, Assistant Secretary of the Medical Protective Company of Chicago.

> "In reply to your inquiry," writes Mr. Haberkorn, "we advise you that our basic premium charge on the standard medical contract is $21.00 for the $10,000 and $30,000 indemnity limits in Ramsey and Hennepin Counties in Minnesota.
>
> "This differentiation has been necessitated by our underwriting experience in the two districts . . .
>
> "Relative to the writing of medical men who do not belong to the State Medical Society, we advise you that we are not writing such men outside of Ramsey and Hennepin Counties on any basis. In Ramsey and Hennepin Counties we are accepting men who have the endorsement of society members but even then we are charging the higher premium of $29.00 to cover such risks . . . "

The Aetna Insurance Company, in accordance with its group contract with the State Society, offers a rate of $21.00 for the $10,000 to $30,000 indemnity limits throughout the State. This company refuses to write insurance for non-members whether in the rural districts or in the three big cities.

Incidentally, the Aetna Company has said recently: "There are some localities in Minnesota where this rate is too low but we are living up to our contract. We hope it may not be necessary to adjust the rating as it has been done in Bismarck, North Dakota, and in the western part of the same state, where the premium for an equal amount of insurance is more than $100."

Obviously non-members underwritten by the Medical Protective Company in the cities profit by the organization and solidarity of physician members who are practicing all around them. But even they have shown themselves to be poorer risks than their brother practitioners who are members of their society. They suffer accordingly. The non-member in the country, cut off from all the loyalties and responsibilities of organization membership, is not a sufficiently good risk to be protected by either company at any price.

The advantages of good organization are further reflected in the malpractice insurance rates paid by neighboring states compared with the rates in Minnesota.

The Aetna Company offers a $21.00 rate for all State Society members.

Following are the rates fixed by the Aetna Company in nearby States:

	$5,000 to $15,000 Rate		*$5,000 to $15,000 Rate*
Indiana	$16.50 (Larger cities)	North Dakota	$25.00 (East)
	$20.00 (Outlying districts)		$75.00 (Middle)
Iowa	$25.00		$150.00 (West)
Minnesota	$15.50	South Dakota	$30.00
		Wisconsin	$25.00

The same principles apply to insurance for the medical profession as apply, for example, to automobile insurance. In the latter case, however, the rates for liability and theft are much lower in the rural districts than in the city.

Underwriters check up without bias or sentiment on the physician's reliability and upon his standing with his fellows. They are interested, solely, in the amount of money the physicians may some day cost their companies. Obviously, good organization such as characterizes the State Society in Minnesota, has an actual cash value which is passed on, in the regular course of events, to the physician purchaser of protection in Minnesota.

OF GENERAL INTEREST

Dr. R. L. Lacey of Bemidji was recently chosen superintendent of the Lake Julia Sanatorium Board of Directors and will take charge January 1, 1933.

Dr. Frank F. Wildebush, graduate of the University of Minnesota, 1927, who had a fellowship in eye, ear, nose and throat work, has become associated with the Siversten Clinic, Minneapolis, in charge of the eye, ear, nose and throat department.

Dr. H. W. Christianson, formerly of the Mayo Clinic, Rochester, Minnesota, is now located at 706 Medical Arts Building, Minneapolis, limiting his practice to surgery of the anus and rectum and diagnosis of colonic, rectal and anal diseases.

Dr. L. Raymond Scherer, graduate of the University of Minnesota, 1928, who had a fellowship in medicine and also post graduate work in Philadelphia, has become associated with the Sivertsen Clinic, Minneapolis, in charge of the department of internal medicine.

Dr. W. H. Valentine of Tracy, Minnesota, was elected president of the Minnesota Sanitary Conference held in Saint Paul the latter part of October. Other officers are Dr. L. M. Roberts, Little Falls, vice president, and Dr. A. J. Chesley of the State Board of Control, who was re-elected secretary-treasurer.

Dr. L. C. Culligan of Saint Paul has been admitted to a fellowship in the American College of Surgeons. Dr. Culligan is a graduate of the University of Minnesota, 1922, and completed a fellowship in The Mayo Clinic, Rochester, Minnesota, in 1926. He is a member of the surgical staff at the United States Veterans Hospital at Fort Snelling.

At its meeting in October, the Board of Directors of the American Society for the Control of Cancer took the following action:

It was voted that the *Bulletin* of the Society be made its official organ and that the present relationship between the Society and the *American Journal of Cancer* be discontinued.

Three new buildings—the Henry M. Hurd Memorial Hall, the Osler Medical Clinic and the Halsted Surgical Clinic—have been recently added to the Johns Hopkins Hospital and were dedicated on October 28, 1932, with appropriate ceremonies. The cost of the new buildings totals nearly $2,000,000, and an endowment for maintenance of $3,000,000 by an unnamed benefactor added to the interest in the dedicatory proceedings.

Dr. J. M. T. Finney, professor of surgery, in addressing the audience, recalled that it was Dr. William S. Halsted who "introduced the use of rubber gloves, one of the greatest single contributions to the operating room technic ever made." Dr. Finney added: "Just here enters a touch of hospital romance. The use of rubber gloves in the operating room was first suggested in order to protect the hands of the then operating room nurse, the future Mrs. Halsted."

Dr. William S. Thayer made the dedicatory address at the opening of the Osler Medical Clinic.

The Henry M. Hurd Memorial Hall costing $150,000 was made possible by a gift from the late George K. McGaw, a trustee, accompanied by a $35,000 endowment fund. Dr. Hurd had been superintendent of the Johns Hopkins Hospital from 1889 to 1911, in addition to being professor of psychiatry.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MINNEAPOLIS NATUROPATH PLEADS GUILTY TO PRACTICING HEALING

State of Minnesota *vs.* P. O. Olson

P. O. Olson, forty-seven years of age, 4021 Elliot Avenue South, Minneapolis, Minnesota, entered a plea of guilty to an information charging him with practicing healing without a Basic Science Certificate before the Honorable Harold Baker, Judge of the District Court, Willmar, Minnesota, on October 3, 1932.

Olson, who claims to have received a degree of Doctor of Naturopathy for the sum of three hundred dollars after attending school for one year in Minneapolis, has been making frequent trips from his home in Minneapolis to Willmar, Minnesota, and that vicinity. In 1931 he was ordered by the County Attorney of Kandiyohi County, Mr. Charles A. Swenson, to desist from practicing healing without a license. Subsequently, Olson has been making trips in the vicinity of Harrison. He was arrested following an investigation made by the State Board of Medical Examiners in May, at which time he admitted that he had been in Harrison for the last two weeks in April and had averaged sixty dollars per week in cash from his treatment of patients. Olson also refers to himself as a "magnetic healer."

Judge Baker sentenced the defendant to a term of ninety days in the county jail of Kandiyohi County. This sentence was suspended upon the following conditions: (1) that Olson pay Kandiyohi County's costs of the proceedings amounting to $32.20; (2) that the defendant absolutely refrain from practicing healing in any manner whatsoever in the State of Minnesota. Judge Baker instructed the defendant that he was to absolutely refrain from practicing healing in any form in the State of Minnesota until and unless he was properly licensed. The Court also informed the defendant that if it was brought to the attention of the Court that he practiced in the future, the Court would order a bench warrant issued for his arrest. In previous prosecutions before Judge Baker the Court has demonstrated that he means exactly what he says and Olson undoubtedly was impressed by the warning he received from the Court. Olson informed the Court that he was not a citizen and was anticipating going back to Sweden.

SELF-STYLED "DRUGGIST" FOUND NOT GUILTY OF PRACTICING HEALING

State of Minnesota *vs.* A. L. Collen

On October 11, 1932, a jury in the Court of the Honorable Karl Finkelnburg returned a verdict of not guilty in the case of State *vs.* Collen. The defendant, forty-six years of age, was tried on an information charging him with practicing healing without a Basic Science Certificate.

The State claimed that the defendant had rendered treatment to Mrs. Kirsten Jacobson of Dennison, Minnesota, following an automobile accident at Dakota, Minnesota, on July 15, 1932. In that accident Mrs. Jacobson sustained a Colles' fracture and a fractured patella in addition to other cuts and bruises. When the defendant was asked for his bill he made a charge of $15.50 which later was settled for $7.50. Collen operates a store in the Village of Dakota in front of which there is a sign reading "Drugs and Wholesale Chemicals."

On cross examination the defendant admitted that he was not licensed as a pharmacist in the State of Minnesota, nor was he registered under the Basic Science Law. He claimed to have certain credentials in the State of Illinois under the Pharmacy Laws, but these were not produced at the trial.

The case was tried for the State by F. Manley Brist, who was appointed a special assistant County Attorney of Winona County by the Court for this trial, and Mr. E. D. Libera, County Attorney of Winona County. The defendant was represented by M. J. Owen of Winona. The Board has been advised that a splendid spirit of coöperation was shown by Mr. Libera in the prosecution of this case. This is the first time in sixteen cases in Court in 1932, involving violations of the Medical Practice Act and the Basic Science Law, that a verdict of not guilty has been returned.

OBITUARY

John Llewellyn Eliot

1853-1932

Dr. Llewellyn Eliot, eighty years old, for fifty years a practicing physician in Washington, and known throughout the east as an authority on smallpox, died Monday at St. Mary's hospital in Minneapolis.

Son of Dr. Johnson Eliot, Civil war surgeon, he was born in Washington and lived there the major part of his life. During his years of practice he had become acquainted with some of the leading political figures of the nation during the last half century or more. He was attached to the District of Columbia health department, division of smallpox, was in charge of the smallpox hospital there, and was consultant on the disease all along the east coast.

In 1926 with his wife he moved to Minneapolis, after retiring from practice, in order to be near his daughter, Mrs. F. E. Harrington, wife of the Minneapolis health commissioner. Mrs. Harrington, another daughter, Mrs. John C. Hanway of Greenville, Miss., and his wife survive him.

Leroy A. Brown

1855-1932

Dr. Leroy A. Brown, seventy-seven years old, former Saint Paul police surgeon, died November 22, 1932, in Ancker hospital, Saint Paul, after a three months' illness. He had been a resident of Saint Paul forty-six years.

Born in Michigan, where he was graduated from the medical school of the state university, he came to Saint Paul in 1886 to enter practice. Not long afterward he moved to Heron Lake, Minn., where he remained for about a year, moving back to Saint Paul in 1888 to resume his practice there.

In 1915 Dr. Brown was appointed to the staff of police surgeons. On his retirement in March, 1928, he estimated that in his thirteen years of service he had answered approximately 15,000 emergency ambulance calls.

Following his retirement, Dr. Brown engaged in private practice with offices in his home. He is survived by two daughters, Mrs. Ralph E. Brewer and Miss Lucia Brown of St. Paul, and a son, John R. Brown of Kalkaska, Mich.

PROFESSOR PUCKNER AND THE COUNCIL ON PHARMACY AND CHEMISTRY

The death of Prof. William A. Puckner on October 1, after more than twenty-six years of service as Secretary of the Council on Pharmacy and Chemistry, marked an epoch in the work of that body. In February, 1905, the Board of Trustees adopted a resolution creating the Council, and Professor Puckner took office as Secretary on March 1, 1906. It is interesting to realize that three of the members of the Council at its inception—namely, Drs. George H. Simons, Torald Sollmann and Robert Hatcher—are still members of that body and that they with Professor Puckner were a vital force in its activities during its first quarter century. The Council has aided in the elimination of secrecy in medical prescription; it has discouraged misleading statements; it has standardized new preparations before their inclusion in the Pharmacopœia, and it has brought the medical profession of this country to a better realization of scientific therapeutics than obtains anywhere else in the world. In its work the Council has had the approval of the majority of the medical profession, if not their constant coöperation. In 1909, shortly after taking over his duties as Secretary of the Council, the vision of Professor Puckner became so impaired that it was necessary for him to give up laboratory work entirely. Nevertheless, his memory was so remarkable, his grasp of affairs so embracing, and the force of his character so tenacious that he carried on his work efficiently almost to the day of his death. As Secretary of the Council he exercised a rare judicial attitude toward the problems that came before him, at the same time evidencing a scientific point of view in his evaluation of both laboratory and clinical evidence. The Board of Trustees will, at its next meeting, select a successor to the man who served as field marshal in the campaign for scientific therapy during the last twenty-five years. His position brought on him not infrequently bitter attacks and even the enmity of some of the commercial interests that considered themselves damaged by the Council's work. The next epoch in the career of the Council should have the coöperation from practicing physicians so complete as to indicate to manufacturers in the field of pharmacy the necessity for maintaining scientific standards if they wish medical support. (Jour. A. M. A., October 15, 1932, p. 1354.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service.

The Minnesota Sate Medical Association broadcasts weekly at 1:15 o'clock every Wednesday Morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of December will be as follows:

December 7—Congenital Heart Disease.
December 14—Control of Tuberculosis.
December 21—X-ray in Medicine.
December 28—Periodic Health Examination.

MINNESOTA RADIOLOGICAL SOCIETY

The Minnesota Radiological Society held its twelfth meeting at St. Luke's Hospital, Duluth, Minnesota. The following program was presented:

1. Roentgen Findings in Pneumoconiosis—Dr. J. R. McNutt, Duluth.
2. Roentgen Therapy in Carcinoma of the Uterine Corpus—Dr. F. B. Exner, Minneapolis.
3. Roentgen Visualization of the Urethra, Normal and Pathological—Dr. M. H. Nicholson, Duluth.
4. Atelectasis of the Lungs—Dr. F. Hirschboeck, Duluth.

5. Round Table Discussion on Problems of Roentgen Diagnosis and Therapy—Conducted by Dr. Gage Clement, Duluth.

ADDRESS

Diaphragmatic Hernia

A. Roentgen Aspect—Dr. B. R. Kirklin, Rochester.
B. Surgical Aspect—Dr. S. Harrington, Rochester.

LYON-LINCOLN COUNTY SOCIETY

A. Olson of Hendricks was elected President of the Lyon-Lincoln County Medical Society, October 25. Other officers are L. J. Happe, Marshall, Vice President; H. M. Workman, Tracy, Secretary-Treasurer; A. L. Vadheim, Tyler, Delegate, and B. C. Ford, Marshall Alternate. Dr. Ford was elected Censor for a three year term.

REDWOOD-BROWN COUNTY SOCIETY

Seventeen members of the Redwood-Brown County Medical Society held a joint meeting with the staff of Union Hospital at Union Hospital in New Ulm, November 1.

Charles N. Spratt, Minneapolis, talked on "Eye Operations," showing three reels of films to illustrate. Similar meetings are planned monthly during the winter season.

WASHINGTON COUNTY SOCIETY

The Washington County Medical Society held its regular monthly meeting at Stillwater, November 8, 1932. Chas. N. Spratt, Minneapolis, exhibited several reels on "Surgery of the Eye."

WEST CENTRAL MEDICAL SOCIETY

The annual meeting of the West Central Medical Society was held at Morris, Minnesota, in the Merchants Hotel, October 12, 1932. The following officers were elected: President, Dr. A. F. Giesen, Starbucy; vice president, Dr. B. Karn, Ortonville; secretary-treasurer, Dr. A. L. Lindberg, Wheaton. The State delegate is Dr. C. I. Oliver, Graceville; the alternate, Dr. C. Bolsta, Ortonville.

A banquet was served at 7 P. M. followed by the scientific program.

MEETING OF COUNCIL WITH UPPER MISSISSIPPI AND STEARNS-BENTON SOCIETIES

A highly successful innovation in county medical society meetings was jointly staged, Saturday, October 22, by the Upper Mississippi and the Stears-Benton Medical Societies at Little Falls.

The meeting was made the occasion for the regular session of the Council of the State Association which convened at 4 P. M. and Council members were called upon to provide the entire evening's program which follower a dinner at the Buckman Hotel.

More than eighty physicians, many of them from St. Paul, Minneapolis and Duluth and other distant parts of the state, attended the meeting, which has set a precedent to be followed often, according to state officials, in future Council and county society meetings.

The date for the 80th Annual State Meeting was definitely set by the Council for May 22 to 24. The meeting will take place at Rochester. Plans are already under way, Council members were told, to make it the most important meeting ever held in Minnesota.

A thoroughgoing discussion of malpractice insurance rates and their relation to medical organization and medical society dues occupied an important section of the time. Comparisons with rates paid by other neighboring states were made to show the favorable rates offered to members of the Minnesota State Society.

The Council also passed a resolution disapproving of the specific project of a commercial organization known as the Minnesota Mutual Health Bureau to supply medical care, except hospital costs, at the rate of $1.50 per month per family or individual. At the same time the Council took occasion to condemn all such proposals as against the best interests of both the public and the profession of medicine.

The dinner speaker for the occasion was F. J. Savage, St. Paul, Councilor for the Fifth District, who talked on the subject "Your Fifteen Dollars." Other speakers included M. S. Henderson, Rochester, State President, on "Fractures of the Ankle"; W. A. Coventry, Duluth, Councilor of the Ninth District, on "Office Gynecology in the Treatment of Leukorrhea"; J. M. Hayes, Minneapolis, Councilor, Sixth District, on "Cysts of the Neck," and H. Z. Giffin, Rochester, Councilor First District, on "The Data and Special Tests Necessary to a Differential Diagnosis of Various Blood Dyscrasias."

The text of the resolution on the Minnesota Health Bureau follows:

Be It Resolved by the Council of the Minnesota State Medical Association that, inasmuch as there is at the present time a movement on foot whereby a contract may be issued by the *Minnesota Mutual Health Bureau* to any family or individual for the sum of one dollar and fifty cents ($1.50) per month; said contract to cover medical, surgical, and dental expense, except hospital costs and X-ray work (X-ray work to be furnished at a 25% discount); and inasmuch as any physician who contracts with *said Health Bureau* agrees to do so for the sum of sixty cents ($.60) per month for each family or individual and any dentist who agrees to perform dental services agrees to do so for the sum of forty cents ($.40) per month, and further, that the balance of the one dollar and fifty cents ($1.50) or fifty cents ($.50) per month presumably passes into the hands of the *Minnesota Mutual Health Bureau* to cover its costs and profits;

Be It Resolved that such procedure is against the best interests of both the public and the profession of medicine. That in our three largest cities adequate provision, for many years past, has been made for those needing medical attention and unable to pay ordinary fees. That the medical profession has always been willing to modify its charges for services rendered to meet the financial ability of patients to pay. That experience has shown that similar types of service have for years been rendered by certain lodges and that the public will not receive the best type of medical and surgical service by any such method. That primarily this scheme is advanced for the profit of its promoter at the expense of the public and physicians.

Be It Therefore Resolved by the Council of the Minnesota State Medical Association assembled at Little Falls, Minnesota, this 22nd day of October, 1932, that we condemn any such proposal on the ground that such a plan is not in conformity with the laws of this State and would be detrimental to the public health and particularly to that group to which the plan might be offered, and in addition we would recommend to the Local Societies that the membership be advised as to the danger involved both legally and ethically of entering into any such contract, and further that a copy of this resolution be sent to the Secretaries of the Component County Societies, and published in Minnesota Medicine.

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. Edward Schons, Saint Paul
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

MRS. WALTER JACKSON FREEMAN

Mrs. Walter Jackson Freeman, president of the Woman's Auxiliary to the American Medical Association, after three weeks of illness, died in Philadelphia, October 27, 1932.

The daughter of a physician, the wife of a physician, the mother of two physicians, the life and interests of Mrs. Freeman were peculiarly closely allied to the medical profession. Her father was the late Dr. William Williams Keen of Philadelphia.

The Woman's Auxiliary to the American Medical Association has lost an inspiring and able leader, the medical profession an understanding and devoted friend.

COMMITTEE ON STATE HEALTH RELATIONS

At the request of the Council of the State Medical Association, your Committee publishes the following information regarding expenses of patients sent to the University (Minnesota General) Hospital. Dr. H. L. Dunn, the new Superintendent, is formulating certain rules to clarify some questions regarding the application of the laws; these rules are not yet ready for publication.

". . . Minnesota General Hospital shall be primarily and principally designed for the care of legal residents of Minnesota who are afflicted with a malady, deformity, or ailment of a nature that can probably be remedied by hospital service and treatment and who are unable, financially, to secure such care or, in case of a minor, whose parent, guardian (etc). . . . is unable financially to secure such care." (From '21, c. 411, sec. 2.)

Whenever any such case comes to the notice of the sheriff, town clerk, health officer, public health nurse, policeman or other public officer or any physician, it shall be his duty to, and any other person may, file with the judge of probate of the county of legal residence of such person an application for treatment of such person at the Minnesota General Hospital.

Application is made in duplicate on blanks of the Minnesota General Hospital and includes statement of financial situation and physical condition of patient. Judge of probate investigates, and, if satisfied as to inability to pay, appoints a physician in the County to examine the patient. The physician reports in writing in duplicate as to history and examination, and his opinion regarding probability of remedial value of hospital treatment; the report includes also any information available to physician as to the financial situation of the patient. The physician is to receive five dollars for the examination if he is not a salaried official of the government, and, in any case, shall receive his actual and necessary expenses; the Board of County Commissioners shall provide for such payment.

When it appears that the examination ordered by the judge of probate was not made by the patient's own physician, the hospital tries further to protect the physician's interest by attempting to get a statement directly from him as to whether or not he considers the patient to be eligible for admission as a county patient.

If not yet satisfied that patient should have care at the Minnesota General Hospital, the judge may investigate farther and may reject any application found to be without sufficient merit. If application is approved by the judge of probate, he enters the finding and communicates with the Superintendent of the Minnesota General Hospital. If applicant or his legal guardian can pay part of the cost, the court may approve the application on some terms of division of the hospital charges.

If the Hospital can receive the patient, the judge certifies approval of the application to the chairman of the Board of County Commissioners. If the patient cannot travel alone, the Board of County Commissioners appoints someone to take him and is obligated to provide payment of expenses, plus $3.00 per day for the round trip if the companion is not an official. Also the traveling expenses of the patient and one-half the expense charged against the patient while in the hospital is also to be paid by the county of residence of the patient.

The hospital shall treat patients admitted on certificate of the judge of probate of any County at rates based on actual cost as determined by the Board of Regents of the University.

Any resident of the State, if unable to pay ordinary physician's fees and hospital charges, may be admitted upon paying same rate as charged for County patients. The Board of Regents investigates such patients and admits deserving ones whenever there is room.

We are assured that these patients have never interfered with the care of the full number of state-county patients that are permitted by law (the hospital has a right to earn up to a total of $330,000 for the care of state-county patients).

University students and others may under certain circumstances be admitted when there is room.

The Board of Regents of the University shall file a verified report with the State Auditor, with statement of expense charged against each patient, with name of county of each patient, and statement of any sums paid by patient or by any person in his behalf. The State Auditor delivers to the treasurer his draft against the counties involved; the treasurer notifies the county auditors, and payments to the State are made from county poor funds.

Inmates of State institutions under the Board of Control may be admitted to the Minnesota General Hospital for treatment. Expenses are paid by the Board of Control at the same rate charged for county patients.

The staff of the hospital are permitted consultation privileges and also the right to accept private cases, if they are referred by physicians in the state. During the first quarter of this fiscal year this privilege amounted to 2.1 per cent in terms of patient-days or 4.5 per cent in terms of actual number of admissions.

Children under fifteen years of age can be admitted and cared for under the Eustis endowment fund. A note is required from the home doctor concerning the patient's condition and the financial status of the family.

Any further questions will be gladly answered by Dr. H. L. Dunn directly. Your committee will be glad to coöperate in straightening out any misunderstanding that might possibly occur.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of October 12, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, October 12, 1932. The meeting was called to order at 8 o'clock by the President, Dr. J. C. Litzenberg. There were 43 members and one visitor present.

Minutes of the May meeting were read and approved.

The scientific program of the evening was as follows:

Dr. F. C. Rodda (Minneapolis) read his Inaugural Thesis entitled "Intussusception."

DISCUSSION

Dr. Irvine McQuarrie (U. of M.): There is nothing whatsoever that I can add to this paper from the point of view of the pediatrician, but I want to congratulate Dr. Rodda on its composition, its inclusiveness and the judgment that is back of this from his own experience. I would simply like to emphasize the importance of those points which are particularly the pediatrician's province, *i.e.*, the after-care of the patient and the early diagnosis which, as Dr. Rodda pointed out, may be made even by the experienced mother. We at the University Hospital frequently have occasion to see patients too late as many of ours are sent in by doctors out in the country who have not had extensive experience with the condition. Dr. Rodda is now giving lectures on the subject to our students and, therefore, these patients should get into the surgeon's hands earlier when these young men get out in practice. Students ought to be taught to develop a reflex of thinking of that condition immediately when such symptoms as intermittent crying and the postural reactions described by Dr. Rodda first occur. I have wondered if a case ever occurs in which there is no pain. Probably not. I think his idea about abnormal innervation being a possible etiological factor is a very good one. I wish that we had some more definite way of determining that. For instance, I have wondered how an intussuscepted bowel would react following spina anesthesia.

Dr. A. C. Strachauer (Minneapolis): The diagnostic import or necessity of finding a tumor in the lower right quadrant of the abdomen in establishing the diagnosis of intussusception has been overly emphasized, in my opinion. The symptoms are so definite and characteristic that the finding of the tumor is usually quite unnecessary. As a matter of fact, from my personal experience, I have not found tumors in the lower right quadrant. Intussusception in infancy is usually ileocecal in type and not infrequently ileocecocolic. Under both these circumstances tumors, when found on palpation, even after the abdomen is open, are located in the upper right quadrant, lying underneath the liver.

Dr. A. T. Mann (Minneapolis): I have palpated these tumors in the right side of the abdomen from intussusception at the ileocecal valve. They lie rather closer to the midline than the normal position of the cecum and ascending colon. The reason for this is the pull on the mesentery of the entering ileum as it is drawn into the cecum and ascending colon as the intussusception progresses. The root of the mesentery is fixed at the back of the peritoneal cavity somewhere nearer the midline. It is a natural sequence that the mass, when felt, should be somewhat nearer the midline.

In regard to the question of pain as a symptom, I believe that any one of the usual symptoms of intussusception can be absent in special cases, though not all the symptoms can be absent. I recall the report of one case in which pain was stated to have been absent.

Dr. Owen H. Wangensteen (U. of M.): In America a personal experience of 80 cases of intussusception is almost unrivaled. In Australia, England or Denmark, where intussusception occurs far more commonly, 80 cases in one man's experience is not unusual.

In cases brought to the University Hospital, a not infrequent cause in delay is found to be subsidence of vomiting after its initial occurrence. I have been told by several physicians that they were dissuaded from their initial suspicion of the existence of intussusception because of cessation of vomiting, and often despite the continuance of other symptoms, as intermittent pain, blood and mucus in the stool and a palpable tumor. In his very informative paper on intussusception of eleven years ago, the late Dr. Amos Abbott, a keen observer whose experience in the surgery of children was considerable, directed attention to this confusing factor. He states that 100 per cent of his infants with intussusception vomited initially but that in 81 per cent vomiting was not resumed until after the second day. The cause of this abatement in vomiting is somewhat obscure. In looking over a number of records of patients with bowel obstruction, I have been amazed to see how many patients with obstruction of the sigmoid flexure never vomit despite enormous distension. The distension in such instances is almost invariably limited to the colon, due to the proximal competent ileocolic sphincter. Undoubtedly the regurgitation factor is an important one in the determination of the amount and frequency of vomiting in bowel obstruction. An obstruction in the small intestine is more likely to have continued vomiting, there being no competent sphincters proximally to dam back the intestinal content. In insusussception, obstruction occurs at the apex of the intussusception, not essentially a mechanical block of the lumen but as the result of edema of the invaginated gut occasioned by compression of the inner cylinder and its mesentery by the ensheathing cylinder of gut. These invaginations begin usually at the ileocecal angle, and the natural inference concerning the cause of delay in recurrence of vomiting is that the low position of the obstruction necessitates the lapse of some time to convert the initial reflex vomiting into a mechanical regurgitation.

However, if the mother's story is attentively heard and care is exercised in examining the abdomen, the rectum, and the motions of the infant, as Dr. Rodda described so well, an early diagnosis should be made almost invariably. There is one point in the differentiation of strangulation from simple types of obstruction that does not obtain in intussusception. I refer to local tenderness of the abdominal wall. Unlike other strangulation varieties of obstruction, no blood escapes into the peritoneal cavity in intussusception because the gut whose blood supply is compromised is surrounded by the normal ensheathing layer. Hence there is ordinarily no tenderness of the abdominal wall, though the parietes may be rigid during the painful spasmodic contraction of the gut.

I have seen a few cases presenting features of shock as Dr. Rodda mentioned. Last winter a female infant of 18 months with intussusception was admitted to the University Hospital with a pulse of 200. The liberal administration of parenteral fluids did not improve her as a risk. She was then transfused, being given about 300 c.c. of blood. The pulse rate dropped to 160 and its quality improved correspondingly. A compound intussusception (entero-enteric due to a Meckel's diverticulum and an ileocolic) was reduced at operation and the patient convalesced uneventfully. In the experimental laboratory, Dr. Horace Scott and I have been able to show that the blood loss factor may be significant in strangulation types of obstruction, such as intussusception in which interference with the blood supply of the bowel occurs. Ligation of the veins to a 3- or 4-foot segment of gut in a dog usually results fatally after four or five hours. The arteries being intact, under the motive force of systolic blood pressure, blood is driven into the infarcted bowel and the animal bleeds to death into his own gut. In clinical strangulation obstructions in which the constricting agent completely arrests the venous outflow, the blood loss factor is an important one, and transfusion is a remedial agent of value in its correction.

I have been bold enough to attempt conservative reduction in a few cases of intussusception. In only a few instances, however, has it been wholly successful. Usually its merit lies in this: instillation of fluid into the rectum chases the intussusceptum back, so that the surgeon has less to do at operation. In the use of a thin barium enema, the "Achilles' heel" of Hirschsprung's taxis is avoided, in that one can see whether the gut that has telescoped into the colon is completely driven back. Olsson and Pallin, of Einar Key's Clinic in Stockholm, were the first to advocate and practice the method. Barium is allowed to run into the rectum under the influence of three and a half feet of gravity pressure, no piston pressure being employed. Failure to fill the cecum fluoroscopically with barium is indication for immediate operation. The earlier the intussusception the more likely is this conservative method to succeed. I have seen no harm come from its use. Simple intussusception, as Dr. Rodda pointed out, is an affliction essentially of the first year of life and most commonly occurs between the fourth and ninth months. After this age period, compound intussusceptions (entero-enteric and ileocolic) are prone to occur and the method is not to be relied upon.

Hipsley of Sydney, who may boast the best surgical results in the treatment of intussusception (51 successive successes in cases under 36 hours' duration, Medical Journal of Australia, 1918), reported in 1926 acquaintance with the conservative method. Of 105 cases, he was able to reduce 62 without operation with a single death in the group. He advises its routine trial before operation. Hipsley's colleague, Clubbe, who has written an authoritative monograph on intussusception, states that he has been successful in only 10 per cent of instances with the conservative method but employs it regularly to chase the invaginated gut back before making the incision.

No matter where the intussusception presents, the incision should be made on the right side. A short incision almost invariably suffices. With one finger within the abdomen beneath the gut and by a massaging motion of the other hand on the outer surface of the abdominal wall, the intussusception is usually driven back with ease. No attempt should be made to draw the intussusception out of the abdomen until the cecum is reached. To do so necessitates a long incision and the bowel has to be pushed back into the abdomen to negotiate the splenic and hepatic flexures. As the last of the invaginated gut is pushed back, a deliberate attempt should be made to press out and evert the dimple that represents the start of the intussusception.

With early diagnosis and treatment the mortality should be very low in this variety of intestinal obstruction.

Dr. J. C. Litzenberg (Minneapolis): I would like to ask Dr. Rodda why the baby is turned over on his face.

Dr. Rodda: That is the posture the child assumes during the attack of pain. After the pain has passed over, the child relaxes, assumes a normal posture and at times gets up and goes on with its play.

Mr. Byron J. Olson (University of Minnesota Medical School), winner of the Academy's Prize Essay, by invitation read his Thesis entitled "The Role of the Eosinophil in Immune Reactions."

DISCUSSION

Dr. W. P. Larson (U. of M.): I think Dr. Olson's paper emphasizes the point that new and perhaps radical ideas come from the younger generation. I have been in close touch with Mr. Olson's work, and can attest to the care with which he has carried out his experiments. I have been amazed at some of the results he has obtained. The part of his work which has been of most interest to me is that which he has done with eosinophil granules.

Mr. Olson has perfected a technic of obtaining eosinophil granules in quantity from the blood of horses. This blood he has secured from the abattoir of a fox farm where a large number of horses are constantly being killed. With the granules thus obtained he has been able to produce anaphylactic reactions with various foreign proteins without previous sensitization of the experimental animal. So far as I know, this is the first work in which the anaphylactic substance has been produced in vitro, a result which I am sure will have far-reaching consequences. Mr. Olson's work seems to furnish experimental support for the view, which has been held for years by many investigators, that the eosinophil does play an active part in various anaphylactic and allergic phenomena.

In treating the various pollen extracts with eosinophil granules, Mr. Olson has likewise been able to obtain positive skin reactions to these pollens in cases which are not susceptible to hay fever or other atopic conditions.

In the short time allotted to Mr. Olson for this paper, he has only had time to present his work in an abbreviated form. I hope that in the near future it will be our good fortune to have the pleasure of reading his published papers.

Dr. Litzenberg: I think the Academy should feel very happy about awarding the essay prize to Mr. Olson and for having the privilege of hearing his fine, though necessarily sketchy, analysis of the work he has been doing. We are glad to have even a little part in such a piece of work.

Dr. C. N. Spratt (Minneapolis) reported a case of "Intracranial Aneurysms of both Vertebral Arteries." Autopsy specimen was shown.

The meeting adjourned.

R. T. La Vake, M.D., Secretary.

ACETARSONE (STOVARSOL) IN AMEBIASIS

Reports have appeared on the favorable use of the drug in amebiasis, but they are conflicting as to its therapeutic efficiency and toxicity. Experimentally it has been shown to be approximately four times as toxic as originally noted, when administered orally to rabbits and cats. Clinical cases of poisoning are not uncommon, even when therapeutic amounts of the drug are used. New and Non-official Remedies states that the physician should remember that he is working with a rather toxic arsenical preparation, which may give rise to gastro-intestinal symptoms, as well as to the same cutaneous disturbances that are found with the arsphenamines, and that at the least sign of intolerance the physician should discontinue the use of the drug for the time being. There seems to be no doubt that other amebacides, arsenical and nonarsenical, are available which have equal and greater amebacidal action and are less toxic than acetarsone. (Jour. A. M. A., September 3, 1932, p. 851.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

RECEIVED FOR REVIEW

Children's Tonsils—In Or Out. Albert D. Kaiser, M.D., Associate Professor of Pediatrics, University of Rochester Medical School, etc. 307 pages. Illus. Price, cloth, $5.00. Philadelphia: J. B. Lippincott Company, 1932.

Clinical Gynecology. C. Jeff Miller, M.D., Professor of Gynecology, Tulane University. 560 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Company, 1932.

Practical Obstetrics. For Students and Practitioners. P. Brooke Bland, M.D., Professor of Obstetrics, Jefferson Medical College, etc., assisted by Thaddeus L. Montgomery, M.D., Associate in Obstetrics, Jefferson Medical College, Philadelphia. 730 pages. Illus. Price, cloth, $8.00. Philadelphia: F. A. Davis Company, 1932.

Synopsis of Gynecology. H. S. Crossen, M.D., F.A.C.S., Professor of Gynecology, Washington University, and Robert James Crossen, M.D., Instructor in Gynecology, Washington University. 227 pages. Illus. Price, $2.75, cloth. St. Louis: C. V. Mosby Company, 1932.

FERTILITY AND STERILITY IN MARRIAGE: THEIR VOLUNTARY PROMOTION AND LIMITATION. Th. Van de Velde, M.D., formerly Director of the Gynecological Clinic at Haarlem, Holland. Translated by F. W. Stella Browne. New York: Covici Friede—Medical Books, 1932. Price $7.50.

The same author has published "Ideal Marriage" and "Sex Hostility in Marriage," making this volume the third of a series, which are to be considered together as there are numerous cross references. Their writer intended them for general circulation, but the publishers insert a note to the effect that their sale will be limited strictly to "physicians on their written or authorized order." This is wise, for it is not many years since a Minnesota doctor served a term in prison for selling to the public a work along somewhat similar lines, and not a whit more likely than this one to arouse erotic ideas in the prurient. This is not by any means meant to impugn the author's motives. No one could give in a more delicate and inoffensive way the intimate information and advice he offers.

One of Van de Velde's postulates deserves emphasis, and that is that the subject he deals with gets too little attention from physicians, either because they consider it too indelicate, or feel that to deal with it would be lowering to the dignity of the profession. But copulation is quite as important a physiological process as is defecation or micturition, and the doctor should be as well posted on the proper handling of unsatisfactory intercourse as in the management of constipation or of incontinence. Works on general medicine pass lightly over the subject, making a book like Van de Velde's invaluable.

Briefly stated, this thesis is that the complete sexual satisfaction of both husband and wife is a most important part of marriage—indeed that there can be no ideal marriage without it; that there are conditions outside of medical considerations that prohibit the bearing of children; that in such cases contraceptive measures are justifiable, and the bulk of the work is taken up with the discussion on the one hand of measures to overcome sterility, and on the other hand with contraception.

Much of what is said about the promotion of conception and pregnancy is general knowledge. Less well understood are Van de Velde's views on the importance of position in intercourse, the influence of the woman's orgasm, the best time to select in the menstrual cycle, and the chances of success with artificial impregnation. He dwells upon the importance of having the woman thoroughly prepared for intercourse before it is attempted, and gives precise directions about such preparation. He favors the exchange of medical certificates before marriage and considers it a mistake to abstain from intercourse for months before and after delivery, insisting, however, upon extraordinary precautions against infection and mechanical injury, with advice as to how the latter mischief may be avoided. Here are answered questions often asked and sometimes embarrassing to the conscientious physician who feels that he lacks knowledge.

Although there have been no acknowledged changes in federal or state laws prohibiting dealing in contraceptives, there is an evident change in the attitude of the public about them. Not only is the subject discussed freely in the newspapers, but of late instrument dealers have been offering openly various devices for the prevention of conception, chiefly occlusive pessaries and jellies whose only object can be the destruction of spermatozoa. A cap to fit over the cervix with instructions as to how the woman is "to get it out in the morning" leaves little to the imagination as to the purpose.

Medicine is concerned properly with the protection of patients from harm. The physician may well decline to recommend contraceptives to those who seek to avoid pregnancy for social or pecuniary reasons, but he should know at least what measures are harmful and warn his patient accordingly. Van de Velde finds no ideal preventive. To a greater or less degree all are objectionable, many positively injurious, and none sure except excision of the vasa or the tubes. For the sterilization of women he has devised an operation which it is possible to undo later, restoring fertility. This operation, which he has performed successfully both ways, he describes and illustrates.

William Davis, M.D.

HUMAN STERILIZATION: THE HISTORY OF THE STERILIZATION MOVEMENT. J. H. Landman, Ph.D., J.D., J.S.D., of the College of the City of New York. New York: The Macmillan Company, 1932. Price $4.00.

Between March 9, 1907, when Indiana passed the first compulsory eugenic sterilization act, and April 22, 1931, when Oklahoma made a like enactment, a total of thirty states have enrolled themselves as in favor of this kind of legislation. The federal Supreme Court has decided that the general principle of such laws is not in conflict with the Constitution of the United States, leaving the field clear for the champions of eugenics to put their theories into general practice.

Although sterilization is advocated and employed for a variety of reasons, it is on account of the eugenic motive that the laws permitting it are framed. The prime object is to prevent the transmission by inheritance of feeblemindedness, insanity and crime. Under present conditions Landman thinks the outlook is poor for making progress in this way, for he finds that of the feebleminded only about 11 per cent come from the mating of the feebleminded of the previous generation, "while 89 per cent come from marriages among the latent carrier group, which cannot be reached by the light of our present knowledge." So what he thinks is needed is the establishment of an adequate scientific basis through which the 89 per cent can be reached. He asks for more science and less speculation, and until that is had he advises great caution in the employment of compulsory human sterilization.

William Davis, M.D.

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